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BIOLOGIA
CENTRALI-AMERICANA;

OR,

CONTRIBUTIONS TO THE KNOWLEDGE
OF THE
FAUNA AND FLORA
OF
MEXICO AND CENTRAL AMERICA.

EDITED BY
F. DUCANE GODMAN AND OSBERT SALVIN.

BOTANY.

VOL. IV.

BY
W. BOTTING HEMSLEY, A.L.S.,
HON. MEM. NAT. HIST. SOC. MEX.; ASSISTANT FOR INDIA AT THE HERBARIUM OF THE ROYAL GARDENS, KEW;
AUTHOR OF THE "BOTANY OF THE 'CHALLENGER' EXPEDITION," &c.

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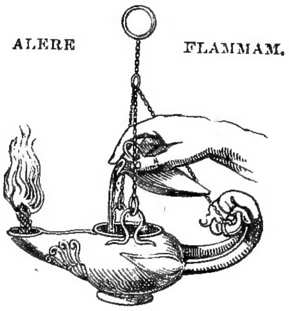

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CONTENTS OF VOLUME IV.

Page

SUPPLEMENTUM: additamenta, emendata et corrigenda:—
Vol. I. 1–46
Vol. II. 46–82
Vol. III. 82–95

Cozumel Island, enumeration of a small collection of plants made in 1885 by Mr. G. F. Gaumer 96–110

A list of plants from Holbox, Mugeres, Cozumel, and Ruatan Islands, off the coasts of Yucatan and Honduras, collected by Mr. G. F. Gaumer in 1886 111–114

Costa-Rican Ferns 115–116

APPENDIX:
Preliminary remarks 117
A sketch of the history of the botanical exploration of Mexico and Central America . 118–137
Outlines of the geography and the prominent features of the Flora of Mexico and Central America 138–167
Summary and analysis of the Flora 168–222
Relationships with the Floras of other regions 223–235
Further details of the distribution of some of the more prominent natural Orders . 235–282
A specimen of the mountain Flora of South Mexico and Central America 282–299
Altitudinal distribution of Orchids in South Mexico, and the dominating features of the general vegetation 300–305

Recapitulation of the dominant features of the Flora of Mexico and Central America, and remarks on its probable derivation 306–315
Bibliography 316–332

INDEX, Vols. I.–IV. 333–498

BIOLOGIA CENTRALI-AMERICANA.

BOTANICA.

SUPPLEMENTUM.

ADDITAMENTA, EMENDATA ET CORRIGENDA†.

RANUNCULACEÆ.

[i. p. 1.] CLEMATIS.

Kunze ("Monographie der Gattung *Clematis*," in Verhandl. Bot. Vereins Brandenb. xxvi. pp. 83–202) reduces the forms included in our enumeration to four species, and this is perhaps the best way of dealing with them. Thus *C. dioica*, Linn., includes *C. acapulcensis*, Hook. et Arn., *C. americana*, Mill., *C. caripensis*, H. B. K., *C. caracasana*, DC., *C. drummondii*, Torr. et Gray, *C. flammulastrum*, Griseb., *C. grahami*, Benth., *C. grossa*, Benth., *C. moçiniana*, Don., *C. nervata*, Benth., *C. polycephala*, Bert., *C. pubescens*, Benth., and *C. sericea*, H. B. K.; *C. pauciflora*, Nutt., is reduced to *C. lasiantha*, Nutt., a common Californian species; *C. filifera*, Benth., and *C. pitcheri*, Torr. & Gr., are referred to *C. simsii*, Sweet (*C. cordata*, Sims, Bot. Mag. t. 1816), a species ranging from Mississippi State to Mexico; finally, *C. reticulata*, Walt., is reduced to *C. viorna*, Linn., which, as circumscribed by Kunze, has a wide range in Eastern North America, and also occurs in Amur-land.

[i. p. 2.] 11*. **Clematis pitcheri,** Torr. & A. Gr. Fl. N. Am. i. p. 10; S. Wats. in Proc. Am. Acad. xvii. p. 317.

ILLINOIS to TEXAS.—NORTH MEXICO, Coahuila (*Palmer*); SOUTH MEXICO, Guanajuato (*Dugès*).

Watson regards *C. filifera*, Benth., as a synonym of this.

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† This does not profess to be complete, but is intended to include as nearly as possible all the new facts bearing upon the distribution of the plants of Mexico and Central America. There is a very considerable number of new species from North Mexico, as well as an extension of the range into Mexico of many additional Texan and New Mexican species.

[i. p. 3.] THALICTRUM.

A Monograph of this genus by J. C. Lecoyer has lately appeared (Bull. Soc. Bot. Belg. xxiv. 1885, pp. 78–324, tt. 1–5), and the author describes three proposed new species from within our limits. Altogether he admits sixty-nine species, which he classifies in two ranks according to their degree of distinctness, designating them primary and secondary species. Out of the sixty-nine species retained by Lecoyer, thirty-three are peculiar to Asia, five to Europe, one to Africa, and twenty to America. The Mexican and Central-American species enumerated in this Monograph follow, the primary species being preceded by a star:—

*_T. hernandezi_, Tausch., _T. lanatum_, Lec., n. sp. (South Mexico), _T. peltatum_, DC. (Costa Rica), *_T. pubigerum_, Benth., *_T. longistylum_, DC., *_T. galeottii_, Lec., n. sp. (South Mexico), _T. gibbosum_, Lec., n. sp. (South Mexico), *_T. wrightii_, A. Gr., _T. fendleri_, Engelm.

Including his new species, Lecoyer records only nine, against our eleven, species. On the evidence of collectors' numbers alone, he declares (loc. cit. p. 319) our _T. strigillosum_ to be a mixture of _T. pubigerum_ and _T. hernandezii_. The former is a very distinct species, of which we have examined the type specimen; and as to the latter, of which we have seen no authenticated specimens, if correctly described, it is quite different from ours.

[i. p. 4.] 10. **Thalictrum strigillosum,** Hemsl.

Guatemala (_Bernoulli & Cario_, 3299). Hb. Kew.

[i. p. 6.] 5. **Ranunculus dichotomus,** Moç. et Sessé.

Guatemala (_Bernoulli & Cario_, 3304, 3305). Hb. Kew.

[i. p. 6.] 6*. **Ranunculus galeotti,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 276.

Mexico (_Galeotti_, 4567).

Most likely _R. hookeri_, to which the number cited of Galeotti's collection is referred in the Kew Herbarium.

[i. p. 6.] 7. **Ranunculus geoides,** H. B. K.; S. Wats. in Proc. Am. Acad. xvii. p. 317.

North Mexico, Guajuco, Nuevo Leon (_Palmer_). Hb. Kew.

[i. p. 6.] 8. **Ranunculus hookeri,** Schl.

Guatemala (_Bernoulli & Cario_, 3301, 3302). Hb. Kew.

[i. p. 8.] 1*. **Aquilegia longissima,** A. Gr. in herb. ex S. Wats. in Proc. Am. Acad. xvii. p. 317.

North Mexico, Caracol Mountains, south of Monclova, Coahuila (_Palmer_, 10). Hb. Kew.

[i. p. 9.] 1*. **Delphinium azureum,** Michx. Fl. Bor.-Am. i. p. 314; Torr. & A. Gr. Fl. N. Am. i. p. 32; S. Wats. in Proc. Am. Acad. xvii. p. 318.

CANADA southward.—NORTH MEXICO, Guajuco, Nuevo Leon (*Palmer*, 11). Hb. Kew.

[i. p. 9.] 3. **Delphinium leptophyllum,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, San Miguelito Mountains (*Schaffner*); SOUTH MEXICO, Guanajuato (*Dugès*).

MENISPERMACEÆ.

[i. p. 21.] **Cissampelos heterophylla,** DC.; Miers, Contrib. Bot. iii. p. 145.

SOUTH MEXICO, San Blas (*Thibaud*, ex *DC.*).—JAMAICA; TRINIDAD (ex *Miers*).

[i. p. 22.] **Cissampelos tomentosa,** DC.; Miers, Contrib. Bot. iii. p. 152.

CUBA; JAMAICA (ex *Miers*).

1*. CLAMBUS.

Clambus, Miers in Ann. Nat. Hist. ser. 3, xviii. p. 16, et Contrib. Bot. iii. p. 233; Benth. et Hook. Gen. Plant. i. p. 962.

A Mexican monotype.

1. **Clambus araneosus,** Miers, Contrib. Bot. iii. p. 234.

MEXICO (*Pavon*).

BERBERIDEÆ.

[i. p. 23.] 9. **Berberis gracilis,** Hartw. var.; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, in the San Miguelito Mountains (*Schaffner*, 711), region of San Luis Potosi (*Parry & Palmer*, 8). Hb. Kew.

[i. p. 23.] 11. *Berberis ilicina*, Hemsl. (*Mahonia ilicina*, Schl.),=13. **B. pallida,** Hartw. ex Schl. ipse in Bot. Zeit. xii. p. 655.

[i. p. 23.] *Mahonia trifolia*, Ch. et Schl.,=16. **Berberis schiedeana,** Schl.

[i. p. 24.] 16. **Berberis schiedeana,** Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 318. *Mahonia trifolia*, Ch. et Schl.

NORTH MEXICO, in the Sierra Madre, forty miles south of Saltillo (*Palmer*, 14). Hb. Kew.

[i. p. 24.] 18. **Berberis trifoliolata,** Moric.; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, in the same locality as *B. schiedeana*, and also at Lerios forty-five miles east of Saltillo (*Palmer*, 15, 16). Hb. Kew.

NYMPHÆACEÆ.

[i. p. 25.] 1. **Nymphæa ampla,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila, and at Monclova (*Palmer*, 17, 18). Hb. Kew.

PAPAVERACEÆ.

[i. p. 26.] 1. **Argemone fruticosa,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 21). Hb. Kew.

[i. p. 27.] 3. *Argemone hispida*, A. Gr., = **A. platyceras,** Link et Otto, Ic. Pl. Rar. Hort. Bot. Berol. p. 85, t. 43.

The flowers, which had not been collected before, are noted as sulphur-yellow, and are 2½ to 3 inches in diameter; and the beaks of the sepals are large and conical, terminating in stout rigid spines.

[i. p. 27.] 6. **Argemone platyceras,** Link & Otto, Ic. Pl. Rar. Hort. Berol. p. 85, t. 43; S. Wats. in Proc. Am. Acad. xvii. p. 318.

NORTH MEXICO, Saltillo (*Palmer*, 19), region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 10). Hb. Kew.

"A probable variety was also collected at Parras (*Palmer*, 20), with the large flowers of a decided pink colour, and the seeds less than half a line long, scarcely more than half of the usual size."—*S. Watson.*

[i. p. 27.] 1. **Bocconia frutescens,** Linn.; S. Wats. in Proc. Am. Acad. xvii. p. 319.

NORTH MEXICO, Guajuco, Nuevo Leon (*Palmer*, 23). Hb. Kew.

CRUCIFERÆ.

[i. p. 30.] 1*. **Arabis mexicana,** S. Wats. in Proc. Am. Acad. xvii. p. 319.

SOUTH MEXICO, near Guanajuato (*Dugès*).

"Popularly known as 'Lantejuelilla,' and considered injurious to cattle eating it."

[i. p. 30.] 1**. **Arabis runcinata,** S. Wats. in Proc. Am. Acad. xvii. p. 319.

NORTH MEXICO, in shaded places about San Luis Potosi (*Schaffner*).

[i. p. 30.] 3. *Streptanthus linearifolius*, A. Gr.,=**Thelypodium linearifolium,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

North Mexico, Saltillo (*Palmer*, 36). Hb. Kew.

[i. p. 31.] 1. **Thelypodium longifolium,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

North Mexico, San Miguelito Mountains (*Schaffner*).

[i. p. 31.] 1*. **Thelypodium micranthum,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

Streptanthus micranthus, A. Gr. Pl. Fendl. p. 7.

New Mexico.—North Mexico, Sierra Madre, Coahuila (*Palmer*, 37), San Luis Potosi (*Schaffner*). Hb. Kew.

[i. p. 31.] 3. **Thelypodium,** sp. n.

Guatemala (*Bernoulli & Cario*, 3318). Hb. Kew.

[i. p. 32.] *Cardamine affinis*, H. & Arn. ?; Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 294 (*Linden*, 1127),=**Nasturtium orizabæ.**

[i. p. 32.] 1*. **Cardamine auriculata,** S. Wats. in Proc. Am. Acad. xvii. p. 319.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 49). Hb. Kew.

[i. p. 32.] 1. *Cardamine chilensis*, DC. ?, Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 294 (*Galeotti*, 3063),=**C. angulata.**

[i. p. 32.] 3. *Cardamine schaffneri*, Hook. f.,=**C. gambelii,** S. Wats. in Bot. Calif. i. p. 30, et in Proc. Am. Acad. xvii. p. 319.

California.

[i. p. 33.] 4. **Vesicaria purpurea,** A. Gr.; S. Wats. Proc. Am. Acad. xvii. p. 319.

North Mexico, Caracol Mountains, Coahuila (*Palmer*, 29). Hb. Kew.

Palmer's 28, from the Sierra Madre, Coahuila, and 32 from Monterey, Nuevo Leon, may be a form of the same species.

[i. p. 35.] 5. **Vesicaria recurvata,** Engelm.; S. Wats. in Proc. Am. Acad. xvii. p. 320.

Watson regards Parry and Palmer's 25, referred by us to *V. argyræa*, A. Gr., as this species.

[i. p. 33.] 5*. **Vesicaria schaffneri,** S. Wats. in Proc. Am. Acad. xvii. p. 320.

North Mexico, on mountains and in shaded places near San Luis Potosi (*Schaffner*).

[i. p. 33.] 6. *Vesicaria stenophylla*, A. Gr.,=**V. fendleri,** A. Gr., ex S. Wats. in Proc. Am. Acad. xvii. p. 320.

[i. p. 34.] 6*. **Draba unilateralis,** M. E. Jones in Bull. Torr. Club, ix. p. 124.

NORTH MEXICO, about fifteen miles south of the Californian boundary, and about sixty miles from San Diego (*Jones*).

[i. p. 35.] 1*. **Sisymbrium acuticarpum,** M. E. Jones in Amer. Naturalist, xvii. p. 875.

NORTH MEXICO, near the head of the valley of palms, within a few miles of the Californian boundary.

[i. p. 35.] 1. *Sisymbrium auriculatum*, A. Gr.,=**Thelypodium auriculatum,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

NORTH MEXICO, Sierra Madre, Coahuila, and at Lerios (*Palmer*, 25, 50). Hb. Kew.

[i. p. 35.] 3. **Sisymbrium canescens,** Nutt.; S. Wats. in Proc. Am. Acad. xvii. p. 320.

NORTH MEXICO, near San Luis Potosi (*Schaffner*).

[i. p. 37.] 13*. *Sisymbrium titacacense*, Walp.?, Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 304 (*Galeotti*, 4682),=**S. galeottianum,** Fourn. β. **hygrophilum.**

[i. p. 38.] 1. **Synthlipsis berlandieri,** A. Gr., var. **hispida,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

TEXAS.—NORTH MEXICO, Laredo, Tamaulipas (*Berlandier*, 157, 1417).

[i. p. 38.] 2*. **Synthlipsis heterochroma,** S. Wats. in Proc. Am. Acad. xvii. p. 321.

NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 33). Hb. Kew.

[i. p. 38.] 3*. **Lepidium lasiocarpum,** Nutt., Torr., & A. Gr. Fl. N. Am. i. p. 115, var. **tenuipes,** S. Wats. in Proc. Am. Acad. xvii. p. 322.

CALIFORNIA; LOWER CALIFORNIA.—NORTH MEXICO, Parras (*Palmer*, 41).

Watson also refers here 21, 22, and 23 of Parry and Palmer's collection; 14, Bourgeau, and 686, Coulter, which we had identified with various other species. We have not been able to test his determinations; but it is possible that in this, as in many other instances, we have not had the same species as he; numbered collections have to be dealt with most cautiously, for too great a reliance on them has led to the propagation of gross errors.

[i. p. 39.] 1*. **Capsella pubens,** Benth. et Hook. Gen. Pl. i. p. 86; S. Wats. in Proc. Am. Acad. xvii. p. 322.

Hymenolobus pubens, A. Gr. Pl. Wright. i. p. 9, et ii. p. 14.

TEXAS; NEW MEXICO.—NORTH MEXICO, Parras, Coahuila (*Palmer*, 39). Hb. Kew.

[i. p. 39.] 1**. **Capsella? schaffneri,** S. Wats. in Proc. Am. Acad. xvii. p. 322.

NORTH MEXICO, San Miguelito Mountains (*Schaffner*).

CAPPARIDEÆ.

[i. p. 41.] 1*. **Cleome cremoloba,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 318.

Mexico (*Galeotti*, 4656).

[i. p. 41.] 1**. **Cleome macrantha,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 319.

Mexico (*Galeotti*, 4654).

[i. p. 42.] *Cleomella medicaginea*, Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 313 (*Galeotti*, 7216),=2. **C. mexicana.**

[i. p. 42.] 2. **Polanisia trachysperma,** Torr. & A. Gr.; S. Wats. in Proc. Am. Acad. Sc. xvii. p. 323.

North Mexico, mountains north of Monclova, Coahuila (*Palmer*, 53). Hb. Kew.

[i. p. 43.] *Gynandropsis grandiflora*, Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 314 (*Galeotti*, 4655),=1. **G. speciosa.**

[i. p. 44.] 12*. **Capparis isthmensis,** Eichler in Fl. Bras. xiii. 1, p. 269.

✓ Costa Rica, Aguacate (*Hoffmann*); Panama, Veraguas (*Warscewicz*).

[i. p. 44.] 14*. **Capparis neriifolia,** Radlk. in Sitzungsb. Bayer. Akad. Wiss. xiv. p. 180.

Mexico?

[i. p. 45.] 6*. ATAMISQUEA.

Atamisquea, Miers, Trav. Chili, ii. p. 529; Benth. et Hook. Gen. Plant. i. p. 109.

A monotypic genus.

1. **Atamisquea emarginata,** Miers, Trav. Chili, ii. p. 529, et in Trans. Linn. Soc. xxi. p. 2, t. 1; S. Wats. Bot. Calif. i. p. 50, et in Proc. Am. Acad. xx. p. 354; A. Gr. in Amer. Journ. Sc. cxxxi. (1885) p. 166.

California.—North Mexico, Sonora, on the north-western border (*Pringle*).—Mendoza.

[i. p. 45.] FORCHAMMERIA.

1*. **Forchammeria apiocarpa,** Radlk. Meth. Bot. 1883, p. 54, et in Sitzungsb. Bayer. Akad. Wiss. xiv. p. 70.

South Mexico, Acapulco (*Hænke*).

Dr. Radlkofer, after critically examining much better material than we had, confirms the restoration of this genus to the Capparideæ, in which we had anticipated him.

CISTINEÆ.

[i. p. 46.] 1*. **Lechea major,** Michx. Fl. Bor.-Am. i. p. 76; S. Wats. in Proc. Am. Acad. xvii. p. 323; Gray, Manual, ed. 5, p. 81.

CANADA southward.—NORTH MEXICO, San Rafael Mountains (*Schaffner*).

[i. p. 47.] 2. **Helianthemum argenteum,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 323.

NORTH MEXICO, San Miguelito Mountains (*Schaffner*).

[i. p. 47.] 4*. **Helianthemum coulteri,** S. Wats. in Proc. Am. Acad. xvii. p. 323.

NORTH MEXICO, Morales Mountains, San Luis Potosi (*Schaffner*); SOUTH MEXICO, Zimapan (*Coulter*, 743).

We have referred Coulter's 743 in Kew Herbarium to *H. arenicola.*

[i. p. 48.] 7. **Helianthemum patens,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 323.

NORTH MEXICO, San Rafael Mountains (*Schaffner*).

VIOLARIEÆ.

[i. p. 49.] 3. **Viola flagelliformis,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 323.

NORTH MEXICO, Lerios Coahuila (*Palmer*, 56), San Miguelito Mountains (*Schaffner*).

Watson also refers Parry and Palmer's 36 to this species; we had referred it to *V. pubescens*, Ait.; and he further suggests that our *V. latistipula* may be an undeveloped state of the same species.

[i. p. 52.] 3*. **Ionidium galeottii,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 339.

MEXICO (*Galeotti*, 7085).

This is apparently the same as our 17. *Ionidium*, sp.

BIXINEÆ.

[i. p. 56.] 3. **Amoreuxia wrightii,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 324.

Watson regards all the specimens, according to the numbers, which we cite under *A. palmatifida* as belonging to this species, and points out differences in the shape of the seed and in the lobing of the leaves. They are certainly not different from the type of *A. schiedeana*, Planch., yet we may have erred in reducing the latter to the original *A. palmatifida*, Moç. et Sessé.

POLYGALEÆ.

[i. p. 60.] 14*. **Polygala greggii,** S. Wats. in Proc. Am. Acad. xvii. p. 325.
North Mexico, west of Cerralbo (*Gregg*).

[i. p. 60.] 17*. **Polygala inæquiloba,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 349.
Mexico (*Galeotti*, 877 bis).

[i. p. 60.] 18*. **Polygala leptandroides,** Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 349.
According to Linden's number, this is the same as *P. nemoralis*, Bennett.

[i. p. 60.] 21. **Polygala macradenia,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 325.
North Mexico, Juraz, Coahuila (*Palmer*, 325).

[i. p. 60.] 26*. **Polygala palmeri,** S. Wats. in Proc. Am. Acad. xvii. p. 325.
North Mexico, Juraz, Coahuila (*Palmer*).

[i. p. 62.] 35*. **Polygala semialata,** S. Wats. in Proc. Am. Acad. xvii. p. 326.
North Mexico, Monterey, Nuevo Leon (*Palmer*, 67). Hb. Kew.

[i. p. 62.] 39*. **Polygala viridis,** S. Wats. in Proc. Am. Acad. xvii. p. 325.
North Mexico, Caracol Mountains, Coahuila (*Palmer*, 2013).

[i. p. 64.] 1*. **Krameria canescens,** A. Gr. Pl. Wright. i. p. 42; S. Wats. in Proc. Am. Acad. xvii. p. 326; Torr. Bot. U. S. & Mex. Bound. Surv. p. 49, t. 13.
California to Texas.—North Mexico, Soledad, Coahuila (*Palmer*, 61). Hb. Kew.

[i. p. 64.] 3. **Krameria cytisoides,** Cav.; S. Wats. in Proc. Am. Acad. xvii. p. 326.
North Mexico, mountains east of Saltillo (*Palmer*, 59). Hb. Kew.
Watson reduces *K. cinerea*, Schauer, to this species.

[i. p. 64.] 6*. **Krameria ramosissima,** S. Wats. in Proc. Am. Acad. xvii. p. 326.
Krameria parvifolia, β. ramosissima, A. Gr.; Hemsl. huj. op. i. p. 64.
North Mexico, Nuevo Leon (*Berlandier*).

VOCHYSIACEÆ.

✓ [i. p. 65.] 2. **Trigonia lævis,** Aubl.?
Guatemala (*Bernoulli & Cario*, 3193). Hb. Kew.

FRANKENIACEÆ.

[i. p. 66.] 1. **Frankenia grandifolia,** Cham. et Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 326.

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 60). Hb. Kew.

CARYOPHYLLEÆ.

[i. p. 66.] *Silene schizolepis*, Turcz. in Bull. Soc. Nat. Mosc. xxvii. 2, p. 370, = 2. **S. laciniata,** Cav.

[i. p. 67.] 4. **Cerastium molle,** Bartl.; Rohrb. in Linnæa, xxxvii. p. 293.

Cerastium andinum, Peyritsch in Linnæa, xxx. p. 59, non Benth. nec Phil.

South Mexico, Volcan de Toluca at 4100 metres (*Heller; Karwinski*).

[i. p. 68.] 7*. **Cerastium sericeum,** S. Wats. in Proc. Am. Acad. xx. p. 354.

North Mexico, Huachuca Mountains (*Lemmon*).

[i. p. 68.] 9. **Cerastium vulcanicum,** Schl. in Linnæa, xii. p. 208; Rohrb. in Linnæa, xxxvii. p. 284.

Cerastium semidecandrum, Ch. et Schl. in Linnæa, v. p. 233, non Cham. nec Linn., nec Walt.

South Mexico, Orizaba (*Liebmann*), Oaxaca (*Galeotti*).

[i. p. 68.] 3. **Stellaria ciliata,** Vahl.; Rohrb. in Linnæa, xxxvii. p. 277 (varietates plures).

Rohrbach includes under this *S. cuspidata*, Willd., *S. nemorum*, Seem. Bot. Voy. 'Herald,' p. 270, non Linn., and *S. baldwini*, Fenzl., and thus defined the species extends from Mexico through the Andes to Chili.

[i. p. 70.] 5*. **Arenaria liebmanniana,** Rohrb. in Linnæa, xxxvii. p. 274.

Mexico? (*Liebmann*).

[i. p. 70.] 8*. **Arenaria peyritschii,** Rohrb. in Linnæa, xxxvii. p. 264.

Mexico, in marshy places (*Schaffner*), Real del Monte and Cerro Ventoso (*Ehrenberg*), San Miguel near Toluca at 2770 metres (*Heller*).

[i. p. 70.] 9*. **Arenaria rohrbachiana,** Garcke in Linnæa, xxxvii. p. 311.

Mexico.

The description of this species reads very much like our *A. bourgœi*, which it antedates by several years.

[i. p. 71.] 10*. **Arenaria serpens,** H. B. K. Nov. Gen. et Sp. vi. p. 32; Rohrb. in Linnæa, xxxvii. p. 268 (varietates plures).

South Mexico, in various localities (*Liebmann*).—Andes.

As defined by Rohrbach, this includes *R. scopulorum,* H. B. K.

[i. p. 71.] 1. **Sagina linnæi,** Presl; Rohrb. in Linnæa, xxxvii. p. 309.

MEXICO (*Liebmann*).

[i. p. 73.] 2*. **Drymaria crassifolia,** Benth. Bot. Voy. 'Sulphur,' p. 16; S. Wats. in Proc. Am. Acad. xvii. p. 329.

LOWER CALIFORNIA.—NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 73, in part).

[i. p. 73.] 3*. **Drymaria fendleri,** S. Wats. in Proc. Am. Acad. xvii. p. 328.

This species has been founded on specimens referred by A. Gray and others to *D. cordata*, *D. glandulosa*, &c., and ranges, according to its author, from ARIZONA and NEW MEXICO to CENTRAL MEXICO.

[i. p. 73.] 4. **Drymaria glandulosa,** Bartl.; S. Wats. in Proc. Am. Acad. xvii. p. 328.

Watson reduces *D. ramosissima*, Schl., to this species.

[i. p. 75.] 14. **Drymaria polycarpoides,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 329.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 73, in part).

[i. p. 75.] 15*. **Drymaria suffruticosa,** A. Gr. ex S. Wats. in Proc. Am. Acad. xvii. p. 328.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 74). Hb. Kew.

[i. p. 75.] 16. **Drymaria villosa,** Cham. et Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 328.

Watson reduces *D. palustris*, Cham. et Schl., to this species, and quotes 744, Botteri for it.

[i. p. 76.] 1. **Cerdia congestiflora,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 329.

NORTH MEXICO, in mountains near San Luis Potosi (*Schaffner*).

[i. p. 77.] 2. **Cerdia glauca,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 329.

NORTH MEXICO, in the Escobrillos Mountains (*Schaffner*).

[i. p. 77.] 3. **Cerdia purpurascens,** Moç. et Sessé; S. Wats. in Proc. Am. Acad. xvii. p. 329.

NORTH MEXICO, San Luis Potosi (*Schaffner*). Hb. Kew.

[i. p. 79.] 5. **Talinum patens,** Willd.

GUATEMALA (*Bernoulli & Cario*, 3278). Hb. Kew.

PORTULACEÆ.

[i. p. 80.] 2*. **Calandrinia micrantha,** Schl. Hort. Halen. p. 9, t. 5.

South Mexico, near Hacienda de Regla (*Ehrenberg*).

TAMARISCINEÆ.

[i. p. 81.] 3. **Fouquieria splendens,** Engelm.; S. Wats. in Proc. Am. Acad. xvii. p. 329.

North Mexico, in the mountains east of Saltillo, and at San Lorenzo de Laguna, Coahuila (*Palmer*). Hb. Kew.

i. p. 81, throughout, for *Foquiereæ* and *Foquiera*, read *Fouquierieæ* and *Fouquieria*.

[i. p. 81.] Order XX.* ELATINEÆ.

Elatineæ, Benth. et Hook. Gen. Plant. i. p. 162.

Herbs or undershrubs. There are two genera, comprising about twenty species, spread nearly all over the world, except in the colder regions.

1. ELATINE.

Elatine, Linn. Gen. Plant. n. 502; Benth. et Hook. Gen. Plant. i. p. 162.

Small marsh and aquatic herbs inhabiting temperate and subtropical regions all round the globe. There are about six species.

1. **Elatine americana,** Arnott in Edinb. Journ. Nat. Sc. i. p. 431; A. Gr. Man. Bot. Northern U. S. ed. 5, p. 87, et in Proc. Am. Acad. xiii. p. 363.

New Hampshire southward, and also in Oregon and Colorado.—North Mexico, various localities in the valley of San Luis Potosi (*Schaffner*).—South America. Varieties of the same species are recorded from India, Australia, and New Zealand; but Dr. Gray states that they are probably not conspecific. Hb. Kew.

HYPERICINEÆ.

[i. p. 83.] 12*. **Hypericum schaffneri,** S. Wats. in Proc. Am. Acad. xvii. p. 330.

North Mexico, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 73, in part), mountains near San Luis Potosi (*Schaffner*). Hb. Kew.

✓ [i. p. 84.] 4. **Vismia macrophylla,** H. B. K.

Guatemala (*Bernoulli & Cario*, 3065). Hb. Kew.

TERNSTRŒMIACEÆ.

[i. p. 92.] *Ruyschia pavonii*, G. Don?, Turcz. in Bull. Soc. Nat. Mosc. xxxi. 1, p. 390, = 3. **R. mexicana,** Baill.

[i. p. 92.] *Ternstrœmia revoluta*, Splitzb.?, Turcz. in Bull. Soc. Nat. Mosc. xxxi. 1, p. 230, = 3. **T. sylvatica,** at least as to Jurgensen, 567.

[i. p. 95.] 9*. **Saurauja rubiformis,** Vatke in Linnæa, xl. p. 221.
Costa Rica, Alto de la Cruz and Candelaria (*Hoffmann*).

MALVACEÆ.

[i. p. 98.] 1. **Callirhoe involucrata,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 330.
North Mexico, Lerios, Coahuila (*Palmer*, 86). Hb. Kew.

[i. p. 98.] 1*. **Callirhoe leariloba,** A. Gr. in Proc. Am. Acad. xix. p. 74.
Texas.—North Mexico, Lerios, Coahuila (*Palmer*, 85, 86).

i. p. 99, nine lines from top, *Sidalcea neo-mexicana*, A. Gr., is a synonym of *S. malvæflora*, A. Gr., and the place of publication of the former is Pl. Fendl. pp. 20 and 23, not Pl. Wright.

[i. p. 102.] 1*. **Sida alata,** S. Wats. in Proc. Am. Acad. xx. p. 356.
North Mexico, Sonora, about one hundred miles south of the boundary (*Pringle*).

[i. p. 103.] 5*. **Sida berlandieri,** Turcz. in Bull. Soc. Nat. Mosc. xxxi. 1, p. 197.
Mexico (*Berlandier*).

[i. p. 104.] 17*. **Sida filipes,** A. Gr. Pl. Lindl. p. 164, et Pl. Wright. i. p. 19; S. Wats. in Proc. Am. Acad. xvii. p. 331.
Texas.—North Mexico, Monclova, Coahuila (*Palmer*, 106). Hb. Kew.
Perhaps the same as *P. venusta*, Schl.

[i. p. 104.] 20. **Sida glomerata,** Cav.
Guatemala (*Bernoulli & Cario*, 3097). Hb. Kew.

i. p. 104. *Sida filiformis*, Moric.,=*S. diffusa*, H. B. K.

i. p. 105, twelve lines from top, *for* ii. *read* i.

i. p. 106, nine lines from top, *for* Lindl. *read* Lindh.

[i. p. 106.] 43*. **Sida tragiæfolia,** A. Gr. Pl. Lindl. p. 164; S. Wats. in Proc. Am. Acad. xvii. p. 331.
Texas.—North Mexico, mountains north of Monclova, Coahuila (*Palmer*, 103).

[i. p. 107.] 2. **Bastardia viscosa,** H. B. K.
Guatemala (*Bernoulli & Cario*, 3083). Hb. Kew.

[i. p. 108.] 5. **Wissadula spicata,** Presl.
Guatemala (*Bernoulli & Cario*, 3084). Hb. Kew.

[i. p. 110.] 14*. **Abutilon holosericeum,** Scheele in Linnæa, xxi. p. 471; S. Wats. in Proc. Am. Acad. xvii. p. 331.
Abutilon velutinum, A. Gr. Gen. Fl. Am. Bor. Ill. ii. p. 67, t. 125.
New Mexico; Texas.—North Mexico, Soledad, Coahuila (*Palmer*, 111), Monterey (*Eaton & Edwards; Berlandier*). Hb. Kew.

[i. p. 110.] 16*. **Abutilon lemmoni,** S. Wats. in Proc. Am. Acad. xx. p. 357.
Lower California; Arizona.—North Mexico, Santa Cruz, Sonora (*Thurber*).

[i. p. 113.] 1. **Sphæralcea angustifolia,** St. Hil.; S. Wats. in Proc. Am. Acad. xvii. p. 331.
Watson thinks that *S. stellata*, Torr. & A. Gr., must be reduced to this, thus extending the range of the species to Colorado.

i. p. 113. Cancel "*Sphæralcea filicaulis*, Torr. & Gray," and all that relates to it, as no such species exists; the generic name should have been *Sida*.

[i. p. 113.] 5*. **Sphæralcea hastulata,** A. Gr. Pl. Wright. i. p. 17, et ii. p. 21; S. Wats. in Proc. Am. Acad. xvii. p. 331.
Texas.—North Mexico, Saltillo (*Palmer*), in the San Miguelito Mountains (*Schaffner*).

[i. p. 116.] 9. **Pavonia paniculata,** Cav.
Guatemala (*Bernoulli & Cario*, 3101). Hb. Kew.

[i. p. 117.] 16. **Pavonia typhalea,** Cav.
Guatemala (*Bernoulli & Cario*, 3111). Hb. Kew.

[i. p. 119.] 17*. **Malvaviscus spathulatus,** Garcke in Otto & Dietr. Allg. Gart. Zeit. xxi. p. 321.
Mexico.

[i. p. 120.] 3. **Kosteletzkya hastata,** Presl.
Guatemala (*Bernoulli & Cario*, 3081). Hb. Kew.

[i. p. 121.] 12*. **Hibiscus diodon,** DC.?, Turcz. in Bull. Soc. Nat. Mosc. xxxi. i. p. 192.
Mexico (*Galeotti*, 4115).

i. p. 122, six lines from top, *for* Benth. *read* H. B. K.; and, in the seventh line, *for* H. B. K. *read* DC.

[i. p. 124.] 3. **Bombax mexicanum,** Hemsl.?
Guatemala (*Bernoulli & Cario*, 3130). Hb. Kew.

STERCULIACEÆ.

[i. p. 130.] 1. **Hermannia texana,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 332.

NORTH MEXICO, Juraz, Coahuila (*Palmer*, 113). Hb. Kew.

[i. p. 130.] 1*. **Hermannia inflata,** Link et Otto, Ic. Pl. Rar. Hort. Berol. i. p. 55, t. 28; Lindl. & Paxt. Fl. Gard. ii. p. 180, fig. 230; Walp. Ann. iv. p. 324.

SOUTH MEXICO, Temascaltepec (*Deppe*), Tehuantepec (*Andrieux*, 508), Zimapan (*Coulter*, 802). Hb. Kew.

✓ [i. p. 133.] 1. **Theobroma angustifolia,** DC.

GUATEMALA (*Bernoulli & Cario*, 3138). Hb. Kew.

[i. p. 133.] 1. **Guazuma polybotrya,** Cav.?

✓ GUATEMALA (*Bernoulli & Cario*, 3142). Hb. Kew.

[i. p. 134.] 3. **Ayenia microphylla,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 332.

NORTH MEXICO, Juraz, Coahuila (*Palmer*, 114). Hb. Kew.

[i. p. 136.] 1. **Buettneria carthaginensis,** Jacq.

✓ GUATEMALA (*Bernoulli & Cario*, 3131). Hb. Kew.

TILIACEÆ.

✓ [i. p. 138.] 10. **Triumfetta lappala,** Linn.

GUATEMALA (*Bernoulli & Cario*, 3076). Hb. Kew.

✓ [i. p. 139.] 4. **Heliocarpus popayanensis,** H. B. K.

GUATEMALA (*Bernoulli & Cario*, 3070). Hb. Kew.

[i. p. 140.] 3. **Corchorus pilolobus,** Link; S. Wats. in Proc. Am. Acad. xvii. p. 332.

TEXAS.—NORTH MEXICO, Juraz, Coahuila (*Palmer*, 120). Hb. Kew.

✓ [i. p. 140.] 1. **Luhea platypetala,** A. Rich.

GUATEMALA (*Bernoulli & Cario*, 3068). Hb. Kew.

[i. p. 141.] 1. **Tilia mexicana,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 332.

NORTH MEXICO, on the Caracol Mountains, near Monclova, Coahuila (*Palmer*, 118). Hb. Kew.

[i. p. 141.] 1*. **Prockia mexicana,** Turcz. in Bull. Sc. Nat. Mosc. xxvii. 2, p. 334.

MEXICO (*Linden*, 669).

LINACEÆ.

[i. p. 143.] 3. **Linum cruciatum,** Planch.; S. Wats. in Proc. Am. Acad. xvii p. 332.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 121).

[i. p. 143.] 4. **Linum greggii,** Engelm.; S. Wats. in Proc. Am. Acad. xvii. p. 332.

North Mexico, a single specimen from Monterey, Nuevo Leon (*Palmer*).

[i. p. 143.] 6*. **Linum lecheoides,** S. Wats. in Proc. Am. Acad. xvii. p. 332.

North Mexico, in the San Miguelito Mountains, near San Luis Potosi (*Schaffner*, 600).

[i. p. 144.] 9*. **Linum rigidum,** Pursh, Fl. Am. Sept. i. p. 210; S. Wats. in Proc. Am. Acad. xvii. p. 332; Torr. & A. Gr. Fl. N. Am. i. p. 204.

Saskatchewan southward.—North Mexico, Monterey, Nuevo Leon (*Palmer*, 122). Hb. Kew.

[i. p. 144.] 11. **Linum scabrellum,** Planch.; S. Wats. in Proc. Am. Acad. xvii. p. 333.

North Mexico, in the San Miguelito Mountains (*Schaffner*, 603).

[i. p. 144.] 12. **Linum schiedeanum,** Cham. et Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 333.

North Mexico, in the Morales Mountains (*Schaffner*, 601).

MALPIGHIACEÆ.

[i. p. 149.] 8. **Galphimia angustifolia,** Benth. Bot. Voy. 'Sulphur,' p. 9, t. 5 (1844); S. Wats. in Proc. Am. Acad. xvii. p. 333.

Galphimia linifolia, A. Gr. Gen. Ill. ii. p. 196, t. 173 (1849).

North Mexico, in mountains north of Monclova, Coahuila (*Palmer*, 128). Hb. Kew.

[i. p. 151.] 1. **Stigmaphyllum ellipticum,** Ad. Juss.

Guatemala (*Bernoulli & Cario*, 3010). Hb. Kew.

[i. p. 154.] 2*. **Hiræa greggii,** S. Wats. in Proc. Am. Acad. xvii. p. 333.

North Mexico, near Monterey, Nuevo Leon (*Palmer*, 123; *Gregg*). Hb. Kew.

[i. p. 154.] 2**. **Hiræa lilacina,** S. Wats. in Proc. Am. Acad. xvii. p. 333.

North Mexico, on the Caracol Mountains, south of Monclova (*Palmer*, 124), near Palomas (*Gregg*, 328), Rinconada (*Edwards*). Hb. Kew.

[i. p. 157.] 1. **Aspicarpa hartwegiana,** Juss.; S. Wats. in Proc. Am. Acad. xvii. p. 333.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*).

[i. p. 157.] 1*. **Aspicarpa hyssopifolia,** A. Gr. Pl. Lindh. p. 167, Pl. Wright. i. p. 36, et ii. p. 30; S. Wats. in Proc. Am. Acad. xvii. p. 333.

NEW MEXICO; TEXAS.—NORTH MEXICO, at Monclova and the neighbouring Caracol Mountains (*Palmer*).

[i. p. 157.] 2. **Aspicarpa longipes,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 334.

NORTH MEXICO, in the San Miguelito Mountains (*Schaffner*, 902).

ZYGOPHYLLACEÆ.

[i. p. 158.] 1*. **Larrea glutinosa,** Engelm. Bot. Wisliz. Exped. p. 9.

NORTH MEXICO, common from Olla and Cristobal to Chihuahua and Saltillo (*Gregg*).

[i. p. 159.] 1. **Sericodes greggii,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 334.

NORTH MEXICO, San Lorenzo de Laguna and Soledad (*Palmer*, 63, 321). Hb. Kew.

GERANIACEÆ.

[i. p. 160.] 1*. **Geranium crenatum,** S. Wats. in Proc. Am. Acad. xvii. p. 334.

NORTH MEXICO, Lerios, Coahuila (*Palmer*, 136). Hb. Kew.

[i. p. 165.] 35. **Oxalis wrightii,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 335.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 761).

RUTACEÆ.

[i. p. 168.] 1. **Astrophyllum dumosum,** Torr.; S. Wats. in Proc. Am. Acad. xvii. p. 335.

NORTH MEXICO, in the mountains east of Saltillo (*Palmer*, 139).

[i. p. 170.] *Ptelea parvifolia*, A. Gr. (quoad specimen floriferum), = **Helietta parvifolia,** Benth. in Hook. Ic. Pl. xiv. p. 66, t. 1385.

There is one other described species of *Helietta*, a native of Colombia.

SIMARUBACEÆ.

[i. p. 173.] 2. **Castela nicholsoni,** Hook.; S. Wats. in Proc. Am. Acad. xvii. p. 335.

NORTH MEXICO, Juraz, Coahuila (*Palmer.*)

[i. p. 177.] BURSERACEÆ.

Our original enumeration of the Mexican and Central American members of this Order is exceedingly imperfect. Since its publication, however, the tribe *Bursereæ* has been monographed by Dr. Engler in De Candolle's 'Suites au Prodromus,' vol. iv.; from which we extract the species recorded from within our area, together with their distribution and synonymy, arranged according to their affinities.

[i. p. 177.] BURSERA.

Bursera, Linn.; DC. Monogr. Phanerog. iv. p. 36.

Engler defines thirty-nine species, which are restricted to Tropical America and the West Indies.

1. **Bursera gummifera,** Jacq. Sel. Stirp. Amer. p. 94, t. 65; DC. Monogr. Phanerog. iv. p. 39; Desc. Fl. Ant. ii. t. 97.

Elaphrium integrifolium, Tul. in Ann. Sc. Nat. série 3, vi. p. 368.

Florida.—South Mexico, Colima (*Kerber*), Xochialco (*Hahn*), without locality (*Schiede*); Panama (*Duchassaing*).—Colombia; Venezuela, and throughout the West Indies.

β. **pubescens,** Engler in DC. Monogr. Phanerog. iv. p. 40.

South Mexico, Orizaba and Omealca (*Bourgeau*, 2899, 3131).

2. **Bursera ovalifolia,** Engler in DC. Monogr. Phanerog. iv. p. 40.

Elaphrium ovalifolium, Schl. in Linnæa, xvii. p. 248.

South Mexico, without locality (*Schiede*).

3. **Bursera schlechtendalii,** Engler in DC. Monogr. Prodr. iv. p. 41.

Elaphrium simplicifolium, Schl. in Linnæa, xvi. p. 532.

South Mexico, without locality (*Schiede*)

4. **Bursera kerberi,** Engler in DC. Monogr. Phanerog. iv. p. 41.

South Mexico, Colima (*Kerber*).

5. **Bursera lancifolia,** Engler in DC. Monogr. Phanerog. iv. p. 42.

Elaphrium lancifolium, Schl. in Linnæa, xvii. p. 247.

South Mexico (*Schiede*).

6. **Bursera multijuga,** Engler in DC. Monogr. Phanerog. iv. p. 42.

South Mexico, Colima (*Kerber*) in Herb. Delessert, without locality or collector's name.

7. **Bursera karwinskii,** Engler in DC. Monogr. Phanerog. iv. p. 43.

South Mexico, Toliman (*Karwinski*).

8. **Bursera cinerea,** Engler in DC. Monogr. Phanerog. iv. p. 43.

South Mexico, region of Cordova (*Bourgeau*, 2326).

9. **Bursera grandifolia,** Engler in DC. Monogr. Phanerog. iv. p. 45.
Elaphrium grandifolium, Schl. in Linnæa, xvii. p. 249.

South Mexico, in the hot region (*Schiede*), without special locality (*Kerber*).

10. **Bursera heterophylla,** Engler in Monogr. Phanerog. iv. p. 46.

South Mexico, Haquiltenango (*Schiede,* 1007, 1008, 1009).

11. **Bursera microphylla,** A. Gr. in Proc. Am. Acad. v. p. 155; Engler in DC. Monogr. Phanerog. iv. p. 47.

Lower California.—North Mexico, Sierra Tula, Sonora (*Schott*).

12. **Bursera galeottiana,** Engler in DC. Monogr. Phanerog. iv. p. 47.

South Mexico, Tehuacan at 5500 feet (*Galeotti,* 4004), Tintetlan (*Liebmann*), San Gerónimo (*Hahn*).

13. **Bursera fagaroides,** Engler in DC. Monogr. Phanerog. iv. p. 48 (varietates *α. elliptica*; *β. crenulata*; *γ. ramosissima*; *δ. bourgeauana*).
Elaphrium fagaroides, H. B. K. Nov. Gen. et Sp. vii. p. 30, t. 611; Schl. in Linnæa, xvii. p. 245 (varietates 3).
Amyris ventricosa, Llave.

North Mexico, region of San Luis Potosi (*Parry & Palmer,* 108); South Mexico, various localities (*Schiede*), Zacoalco, near Guadalupe, valley of Mexico (*Bourgeau*).

14. **Bursera graveolens,** Triana et Planchon in Ann. Sc. Nat. série 5, xiv. p. 303; Engler in DC. Monogr. Phanerog. iv. p. 49 (varietates *α. pubescens* et *β. pilosa*).
Elaphrium graveolens, H. B. K. Nov. Gen. et Sp. vii. p. 24.
Elaphrium tatamaco, Tul. in Ann. Sc. Nat. série 3, vi. p. 368.
Spondias edmonstonei, Hook. f. in Trans. Linn. Soc. xx. p. 230.

South Mexico, Colima (*Kerber*).—Cuba; Colombia; Peru; Galapagos.

The variety *β. pilosa* is only recorded from Mexico.

15. **Bursera bipinnata,** Engler in DC. Monogr. Phanerog. iv. p. 49.
Elaphrium bipinnatum, Schl. in Linnæa, xvii. p. 631.
Amyris? bipinnata, DC. Prodr. ii. p. 82; Calques des Dess. Pl. Fl. Mex. 197.
Rhus filicina, DC. Prodr. ii. p. 67; Calques des Dess. Pl. Fl. Mex. 189.

North Mexico, San Luis Potosi (*Virlet d'Aoust,* 1544); South Mexico, Volcan de Jorullo at 4000 feet (*Galeotti,* 4002), various localities (*Schiede*).

16. **Bursera gracilis,** Engler in DC. Monogr. Phanerog. iv. p. 50.

South Mexico, Xochialco (*herb. Mus. Paris*).

17. **Bursera mexicana,** Engler in DC. Monogr. Phanerog. iv. p. 51.

North Mexico, San Luis Potosi (*Virlet d'Aoust,* 1267); South Mexico, Cordova (*Finck*), Colima (*Kerber*).

18. **Bursera penicillata,** Engler in DC. Monogr. Phanerog. iv. p. 52.

Elaphrium glabrifolium, Jacq. ex H. B. K. Nov. Gen. et Sp. vii. p. 28; Schl. in Linnæa, xvii. p. 249.
Elaphrium penicillatum, DC. Prodr. i. p. 724; Calques des Dess. Pl. Fl. Mex. 203, et xxx. *c*.

SOUTH MEXICO, Oaxaca (*Galeotti*, 4006; *Uhde*), Volcan de Jorullo (*Humboldt & Bonpland; Schiede*), San Francisco de Jetecala (*Schiede*).

19. **Bursera delpechiana,** Poisson ex Engler in Monogr. Phanerog. iv. p. 53.

MEXICO.

20. **Bursera aloexylon,** Engler in DC. Monogr. Phanerog. iv. p. 52.

Elaphrium aloexylon, Schiede in Linnæa, xvii. p. 252.

SOUTH MEXICO, Real de Huantla and other localities in the hot region (*Schiede*).

21. **Bursera bicolor,** Engler in DC. Monogr. Phanerog. iv. p. 53.

Elaphrium bicolor, Schl. in Linnæa, xvii. p. 625.

SOUTH MEXICO, Real de Huantla, San Francisco, Jetecala, and other localities in the hot region (*Schiede*), without locality (*Karwinski*), Cuernavaca (*Knechtel*).

22. **Bursera pannosa,** Engler in DC. Monogr. Phanerog. iv. p. 54.

SOUTH MEXICO, Mirador, and San Felipe (*Liebmann*).

23. **Bursera sessiliflora,** Engler in DC. Monogr. Phanerog. iv. p. 55.

MEXICO, without locality (*Karwinski*).

24. **Bursera submoniliformis,** Engler in DC. Monogr. Phanerog. iv. p. 55.

MEXICO, Rio Vuellas (*Liebmann*).

25. **Bursera cuneata,** Engler in DC. Monogr. Phanerog. iv. p. 56.

Elaphrium cuneatum, Schl. in Linnæa, xvii. p. 629.

SOUTH MEXICO, Guadalupe, valley of Mexico (*Bourgeau*, 338), near Zamalitzlahuaca and Iguala (*Schiede*), without locality (*Ehrenberg; Schmitz*).

26. **Bursera schiedeana,** Engler in DC. Monogr. Phanerog. iv. p. 57.

SOUTH MEXICO, near Huantla (*Schiede*).

27. **Bursera excelsa,** Engler in DC. Monogr. Phanerog. iv. p. 57.

Elaphrium excelsum, H. B. K. Nov. Gen. et Sp. vii. p. 30, t. 611.

SOUTH MEXICO, frequent between Acapulco and Venta del Exido (*Humboldt & Bonpland*).

28. **Bursera jorullensis,** Engler in DC. Monogr. Phanerog. iv. p. 57.

Elaphrium jorullense, H. B. K. Nov. Gen. et Sp. vii. p. 28, t. 612; Schl. in Linnæa, xvii. p. 628.

SOUTH MEXICO, at the foot of the Volcan de Jorullo (*Humboldt & Bonpland*), Real de Huantla, Iguala, and San Francisco Jetecala (*Schiede*).

29. **Bursera lanuginosa,** Engler in DC. Monogr. Phanerog. iv. p. 58.

Elaphrium lanuginosum, H. B. K. Nov. Gen. et Sp. vii. p. 31.

SOUTH MEXICO, near the village of Cuernavaca (*Humboldt & Bonpland*).

In the absence of sufficient material Engler leaves the following undetermined or undefined:—*Bursera obovata*, Turcz., *Elaphrium ariense*, H. B. K., *Elaphrium copalliferum*, DC., and *Amyris* ? *tecomaca*, DC.

[i. p. 180.] HEDWIGIA.

Hedwigia, Swartz; DC. Monogr. Phanerog. iv. p. 95.

2*. **Hedwigia panamensis,** Engler, Bot. Jahrb. i. p. 42; DC. Monogr. Phanerog. iv. p. 96.

Hedwigia balsamifera, huj. op. i. p. 180, non Swartz.

PANAMA, Rio Grande railway-station (*S. Hayes*, 342).

i. p. 180. Four lines from top, *Rhus potentillæfolia*, Turcz., does not belong here; it is a true *Rhus*, and Engler (DC. Monogr. Phanerog. iv. p. 313) cites Andrieux, 226, and Jurgensen, 283, as belonging to it. See i. p. 218.

[i. p. 184.] Order XXXV.* CHAILLETIACEÆ.

Chailletiaceæ, Benth. et Hook. Gen. Plant. i. p. 340.

Of this Order there are three genera and about forty species, widely spread in Tropical Asia, Africa, and America, and one species occurs in Extratropical South Africa. Two of the genera are exclusively South American.

1. CHAILLETIA.

Chailletia, DC. in Ann. Mus. Par. xvii. p. 153, cum ic.; Benth. et Hook. Gen. Plant. i. p. 341.

About thirty species, having the same range as the Order.

1. **Chailletia,** sp.

GUATEMALA (*Bernoulli & Cario*).

CELASTRINEÆ.

[i. p. 191.] 3. *Mortonia palmeri*, Hemsl., et *M. effusa*, Turcz., = 2. **M. greggii,** A. Gr. ex S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Sierra Madre, south of Saltillo, and in the mountains east of the same place (*Palmer*, 323).

[i. p. 191.] 4. **Mortonia scabrella,** A. Gr., S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Parras. Coahuila (*Palmer*, 2111).

[i. p. 194.] 1. **Llavea integrifolia,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Guajuco, Nuevo Leon, and in the mountains north of Monclova, Coahuila (*Palmer*, 182, 183). Hb. Kew.

RHAMNACEÆ.

[i. p. 195.] 4. **Zizyphus lycioides,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Lerios, Coahuila (*Palmer*, 167). Hb. Kew.

[i. p. 195.] 4*. **Zizyphus obtusifolius,** A. Gr. Pl. Lindh. p. 168; Gen. Pl. Am. Bor. Ill. ii. p. 270, t. 163; S. Wats. in Proc. Am. Acad. xvii. p. 336.

Paliurus texanus, Scheele in Linnæa, xxi. p. 594.
Rhamnus ? obtusifolius, Hook.; Torr. & A. Gr. Fl. N. Am. i. p. 685.

TEXAS.—NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 166). Hb. Kew.

[i. p. 196.] 2. **Condalia spathulata,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Saltillo (*Palmer*, 162). Hb. Kew.

[i. p. 196.] 1. **Microrhamnus ericoides,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Lerios, Coahuila (*Palmer*, 165). Hb. Kew.

[i. p. 199.] 3. *Ceanothus cœruleus,* Lag., = 1. **C. azureus,** Desf. ex S. Wats. in Proc. Am. Acad. xvii. p. 337.

[i. p. 200.] 2. **Sageretia wrightii,** S. Wats. in Proc. Am. Acad. xx. p. 358.

This is a new species, founded by Watson on the Mexican and Arizonian specimens referred by us to *S. michauxii.*

[i. p. 200.] 4. **Colubrina glomerata,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

Barcena guanajuatensis, Dugès in Rev. Cient. Mex. i. p. 8, cum tab., fide Wats.

[i. p. 200.] 4*. **Colubrina greggii,** S. Wats. in Proc. Am. Acad. xvii. p. 336.

NORTH MEXICO, Soledad, Coahuila (*Palmer*, 171), Monterey, Nuevo Leon (*Gregg*, 154). Hb. Kew.

[i. p. 201.] 1. **Adolphia infesta,** Meissn.; S. Wats. in Proc. Am. Acad. xvii. p. 336.

SOUTH MEXICO, Guanajuato (*Dugès*).

Watson is of opinion that *Colletia ? multiflora,* DC., is the same as this.

AMPELIDEÆ.

[i. p. 203.] 3. **Vitis æstivalis,** Michx.; S. Wats. in Proc. Am. Acad. xvii. p. 337.

NORTH MEXICO, Parras, Coahuila, and in the mountains near Saltillo (*Palmer*). Hb. Kew.

[i. p. 203.] 6*. **Vitis (Cissus) chontalensis,** Seem. Journ. Bot. vii. (1869) p. 332.

Nicaragua, mountains of Chontales (*Seemann*).

[i. p. 203.] 6**. **Vitis cordifolia,** Michx. Fl. Am. Bor. ii. p. 231; Torr. & A. Gr. Fl. N. Am. i. p. 244; var.?, S. Wats. in Proc. Am. Acad. xvii. p. 337.

Massachusetts southward.—North Mexico, in the Caracol Mountains, south-east of Monclova, Coahuila (*Palmer*, 179). Hb. Kew.

[i. p. 203.] 10*. **Vitis (Cissus) javalensis,** Seem. Journ. Bot. vii. (1869) p. 332.

Nicaragua, in the neighbourhood of the Javali mine, Chontales (*Seemann*).

[i. p. 203.) 12. **Vitis pubescens,** Hemsl. (*Ampelopsis*, Schl.); S. Wats. in Proc. Am. Acad. xvii. p. 337.

South Mexico, Guanajuato (*Dugès*).

SAPINDACEÆ.

[i. p. 205.] **Urvillea.**

Radlkofer reduces *U. berteriana*, DC., and *U. mexicana*, A. Gr., to *U. ulmacea*, H. B. K., and describes a new species from Mexico :—

1*. **Urvillea dasycarpa,** Radlk. in Sitzungsb. Bayer. Akad. Wiss. 1879, p. 265.

South Mexico, Tlacolola, Oaxaca (*Andrieux*, 486). Hb. Kew.

We have this under *U. mexicana.*

[i. p. 205.] **Serjania.**

All the specimens under 8 belong to the genus *Paullina.*

[i. p. 207.] 15*. **Serjania? inflata,** S. Wats. in Proc. Am. Acad. xvii. p. 337.

North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 186).

In a note in Herb. Kew, Radlkofer says this equals his *S. cystocarpa* in Meth. Bot. Syst. p. 32.

[i. p. 212.] 1. **Æsculus mexicana,** Benth. et Hook. f.

Guatemala (*Bernoulli & Cario*, 2923). Hb. Kew.

[i. p. 212.] 1. **Ungnadia speciosa,** Endl.; S. Wats. in Proc. Am. Acad. xvii. p. 337.

North Mexico, Saltillo, Coahuila and Guajaco, Nuevo Leon (*Palmer*, 187). Hb. Kew.

[i. p. 214.] 1*. **Negundo aceroides,** Mœnch. Meth. Pl. p. 334; A. Gr. Gen. Pl. Am. Bor. Ill. ii. p. 202, t. 175?; S. Wats. in Proc. Am. Acad. xvii. p. 338.

Canada southward.—North Mexico, San Luis Potosi, in cultivated places (*Schaffner*).

[i. p. 214.] 1. **Negundo mexicanum,** DC.
Guatemala (*Bernoulli & Cario*, 2935). Hb. Kew.

[i. p. 214.] 1*. **Acer grandidentatum,** Nutt.; Torr. & A. Gr. Fl. N. Am. i. p. 247; S. Wats. in Proc. Am. Acad. xvii. p 238.
British Columbia southward.—North Mexico, in the Caracol Mountains, Coahuila (*Palmer*).

i. p. 216. *Turpinia tomentosa*, Lag., = **Vernonia monosis,** DC. ii. p. 92.

[i. p. 217.] ANACARDIACEÆ.

Since the publication of the first volume of this work a monograph of this Order, by Dr. Engler, has appeared in De Candolle's 'Suites au Prodromus.' We append the new species described therein and the amended synonymy of the others, as well as additional localities.

[i. p. 217.] 1*. **Rhus andrieuxii,** Engler in DC. Monogr. Phanerog. iv. p. 389.
South Mexico, without locality (*Andrieux*, 271, 465). Hb. Kew.

[i. p. 217.] 5. **Rhus juglandifolia,** H. B. K.; Engler in DC. Monogr. Phanerog. iv. p. 400.
This species has a wide range in Colombia, Peru, and Venezuela.

[i. p. 217.] 5*. **Rhus macrophylla,** Hook. et Arn. Bot. Beech. Voy. p. 413; DC. Monogr. Phanerog. iv. p. 403.
South Mexico, Acapulco (*Beechey*).

[i. p. 218.] 8. **Rhus pachyrrachis,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 338, =*R. sempervirens*, Scheele, β. Engler in DC. Monogr. Phanerog. iv. p. 391.
Texas.—North Mexico, in the San Miguelito Mountains (*Schaffner*).

[i. p. 219.] 15. **Rhus schmidelioides,** Schl.: following Hooker and Arnott, Engler places this as a variety of *R. aromatica*, a widely spread species in North America, extending northward to Saskatchewan (DC. Monogr. Phanerog. iv. p. 385).

[i. p. 219.] 15*. **Rhus sempervirens,** Scheele in Linnæa, xxiii. p. 566; DC. Monogr. Phanerog. iv. p. 390.
Rhus virens, Lindh. in A. Gr. Pl. Lindh. ii. p. 159; huj. op. i. p. 220.
Engler regards our *R. pachyrrhachis* as a variety of this.

[i. p. 220.] 20. **Rhus virens,** Lindh.; S. Wats. in Proc. Am. Acad. xvii. p. 338.
North Mexico, in the Sierra Madre, south of Saltillo, and in the Caracol Mountains, Coahuila (*Palmer*, 189, 190). Hb. Kew.

[i. p. 221.] 2. **Anacardium rhinocarpus,** DC.; Engler in DC. Monogr. Phanerog. iv. p. 216.
Costa Rica (*Warscewicz*); Panama, Chiriqui (*Wagner*).—Colombia to Guiana.

[i. p. 221.] 1. **Pistacia mexicana,** H. B. K.; S. Wats. in Proc. Am. Acad. xvii. p. 338.

North Mexico, Saltillo, Coahuila (*Palmer*, 196), in the Morales, San Rafael and San Miguelito Mountains, San Luis Potosi (*Schaffner*).

[i. p. 221.] 1. **Pseudosmodingium andrieuxii,** Engler, Bot. Jahrb. i. p. 419; DC. Monogr. Phanerog. iv. p. 369.

Smodingium andrieuxii, Baill. Adansonia, xi. p. 182.

South Mexico, Province of Mexico (*Andrieux*, 184). Hb. Kew.

[i. p. 221.] 2. **Pseudosmodingium virletii,** Engler, Bot. Jahrb. i. p. 419; DC. Monogr. Phanerog. iv. p. 370.

Smodingium virletii, Baill. Adansonia, xi. p. 182.

North Mexico, San Luis Potosi (*Virlet d'Aoust*).

[i. p. 221.] 3. **Pseudosmodingium perniciosum,** Engler, Bot. Jahrb. i. p. 420; DC. Monogr. Phanerog. iv. p. 370.

Rhus ? perniciosa, H. B. K. Nov. Gen. et Sp. vii. p. 10; huj. op. i. p. 218.

South Mexico, Jorullo (*Schiede*), mountains near "Apazingau" (*Ghiesbreght*).

The genus *Pseudosmodingium* is restricted to Mexico.

[i. p. 222.] 1*. **Tapiria mexicana,** Marchand, Rev. Anac. p. 162; DC. Monogr. Phanerog. iv. p. 281 (*Tapirira*).

South Mexico, valley of Cordova (*Bourgeau*, 2237), Orizaba (*Botteri*), Hacienda de la Laguna (*Schiede*).

Four other Tropical-American species of this genus are described.

[i. p. 222.] 1. *Cyrtocarpa procera,* H. B K., is retained by Engler as an independent monotypic genus (DC. Monogr. Phanerog. iv. p. 274). See Tapiria.

[i. p. 224.] 1. **Cnestidium rufescens,** Planch.

Guatemala (*Bernoulli & Cario*). Hb. Kew.

LEGUMINOSÆ.

[i. p. 230.] 8. **Lupinus ehrenbergii,** Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 338.

North Mexico, Lerios, Coahuila (*Palmer*, 197).

[i. p. 230.] 13*. **Lupinus leonensis,** S. Wats. in Proc. Am. Acad. xvii. p. 338.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 198).

[i. p. 233.] 5. **Trifolium schiedeanum,** S. Wats. in Proc. Am. Acad. xvii. p. 339.

Trifolium reflexum, Schl. in Linnæa, v. p. 576, et huj. op., non Linn.

North Mexico, Lerios, forty-five miles east of Saltillo (*Palmer*, 201); South Mexico, Jalapa (*Schiede & Deppe*).

[i. p. 235.] 4*. **Psoralea rhombifolia,** Torr. & A. Gr. Fl. N. Am. i. pp. 303 et 688; S. Wats. in Proc. Am. Acad. xvii. p. 339.

TEXAS.—NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 222).

[i. p. 236.] 2*. **Eysenhardtia orthocarpa,** S. Wats. in Proc. Am. Acad. xvii. p. 339 (*E. amorphoides*, huj. op. pro parte).

Eysenhardtia amorphoides var. *orthocarpa,* A. Gr. Pl. Wright. ii. p. 37.

ARIZONA; NEW MEXICO.—NORTH MEXICO, near San Luis Potosi (*Parry & Palmer*, 143; *Schaffner*, 782); SOUTH MEXICO, Tacubaya (*Bourgeau*, 82; *Bilimek*, 108). Hb. Kew.

[i. p. 237.] 4*. **Dalea aurea,** Nutt.; Torr. & A. Gr. Fl. N. Am. i. p. 308; Pl. Wright. i. p. 46, et ii. p. 41, et Pl. Lindl. pp. 7 et 31; S. Wats. in Proc. Am. Acad. xvii. p. 340.

MISSOURI southward.—NORTH MEXICO, in the Caracol Mountains, Coahuila (*Palmer*, 226).

[i. p. 237.] 7. **Dalea berlandieri,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 340.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 209).

[i. p. 239.] 22*. **Dalea eriophylla,** S. Wats. in Proc. Am. Acad. xvii. p. 340.

NORTH MEXICO, in the Sierra Madre, forty miles south of Saltillo (*Palmer*, 211).

[i. p. 241.] 29. **Dalea frutescens,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 341.

NORTH MEXICO, in the Sierra Madre, south of Saltillo, at Juraz, Coahuila, and at Monterey, Nuevo Leon (*Palmer*, 205, 206, 212).

[i. p. 241.] 30. **Dalea greggii,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 341.

To this Watson refers Parry and Palmer's 147, 152, and 1048, in part, our 92, *Dalea*, sp.

[i. p. 242.] 40*. **Dalea lasiathera,** A. Gr. Pl. Wright. i. p. 48, et ii. p. 37; S. Wats. in Proc. Am. Acad. xvii. p. 340.

TEXAS.—NORTH MEXICO, in the Caracol Mountains, Coahuila, and at Guajuco, Nuevo Leon (*Palmer*, 224, 225). Hb. Kew.

[i. p. 242.] 44*. **Dalea luisana,** S. Wats. in Proc. Am. Acad. xvii. p. 341.

NORTH MEXICO, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 164; *Schaffner*, 808).

We suspect a transposition of Parry and Palmer's 162 and 164 in the set we had under observation, as Watson refers the former, which we could not match in the

Kew Herbarium, to *D. wrightii*, whilst we identified with it the specimens bearing the latter number.

[i. p. 243.] 48*. **Dalea (Xylodalea) megacarpa,** S. Wats. in Proc. Am. Acad. xx. p. 359.

NORTH MEXICO, Sonora, about ten miles south of the boundary (*Pringle*).

[i. p. 243.] 53. **Dalea nana,** Torr.; A. Gr. Pl. Fendl. p. 31, Pl. Lindh. p. 175, Pl. Wright. i. p. 46, et ii. p. 37; S. Wats. in Proc. Am. Acad. xvii. p. 340.

ARIZONA; NEW MEXICO; TEXAS.—NORTH MEXICO, in the Sierra Madre, south of Saltillo, at Monclova and Soledad, Coahuila, and Monterey, Nuevo Leon (*Palmer*, 217, 218, 227, 228). Hb. Kew.

[i. p. 244.] 60. **Dalea pogonathera,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 340.

NORTH MEXICO, Monclova and Soledad, Coahuila, and at Monterey, Nuevo Leon (*Palmer*, 216, 219, 220). Hb. Kew.

[i. p. 245.] 66*. **Dalea radicans,** S. Wats. in Proc. Am. Acad. xvii. p. 341.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 214).

[i. p. 251.] 10*. **Indigofera lindheimeriana,** Scheele in Linnæa, xxi. p. 464; A. Gr. Pl. Wright. i. p. 45; S. Wats. in Proc. Am. Acad. xvii. p. 342.

TEXAS.—NORTH MEXICO, Monclova, Coahuila (*Palmer*, 233).

[i. p. 254.] 6. **Brongniartia intermedia,** Moric.; S. Wats. in Proc. Am. Acad. xvii. p. 342.

NORTH MEXICO, in the San Miguelito Mountains, San Luis Potosi (*Schaffner*, 828).

[i. p. 258.] 17. **Tephrosia tenella,** A. Gr.?; S. Wats. in Proc. Am. Acad. xvii. p. 342.

NORTH MEXICO, Soledad, Coahuila (*Palmer*, 257).

[i. p. 259.] *Robinia melanocarpa*, Schl., = **Lennea robinioides,** Kl. huj. op. i. p. 260, fide Vatke in Linnæa, xliii. p. 335.

Acting on the rule of adopting the first specific name applied to a plant, Vatke proposes calling this *Lennea melanocarpa*.

[i. p. 263.] 2. **Sesbania cavanillesii,** S. Wats. in Proc. Am. Acad. xvii. p. 342.

Daubentonia longifolia, DC. Mém. Legum. p. 286; Prodr. ii. p. 267.
Æschynomene longifolia, Cav. Ic. Il. iv. p. 8, t. 315, non Ort.

TEXAS.—NORTH MEXICO.

Watson refers Parry and Palmer's 209 here, with the remark that it is very different from *Sesbania longifolia*, DC., which we had named it.

[i. p. 263.] 1*. **Astragalus antoninus,** S. Wats. in Proc. Am. Acad. xvii. p. 343.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 239), San Antonio de las Alauzanes (*Gregg*, 363).

[i. p. 263.] 1**. **Astragalus arizonicus,** A. Gr. Proc. Am. Acad. vii. p. 398; S. Wats. in Proc. Am. Acad. xvii. p. 343.

Astragalus sonoræ, Torr. Bot. U. S. & Mex. Bound. Surv. p. 56, non A. Gr.

Arizona; New Mexico.—North Mexico, Parras, Coahuila (*Palmer*, 234).

[i. p. 264.] 3*. **Astragalus diphacus,** S. Wats. in Proc. Am. Acad. xvii. p. 342.

North Mexico, San Miguelito Mountains, San Luis Potosi (*Schaffner*, 816, mainly).

[i. p. 264.] 5*. **Astragalus greggii,** S. Wats. in Proc. Am. Acad. xvii. p. 343.

North Mexico, in the mountains east of Saltillo (*Palmer*, 238), without locality (*Gregg*, 439).

[i. p. 264.] 7. **Astragalus hartwegii,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 343.

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 235).

Watson reduces *A. vaccarum*, A. Gr., to this.

[i. p. 264.] 8. **Astragalus helleri,** Fenzl.

For description of this plant, see Bonplandia, 1860, p. 56.

[i. p. 265.] 16. **Astragalus orthanthus,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 342.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 243).

[i. p. 266.] 18. **Astragalus parvus,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 343.

North Mexico, in the San Miguelito Mountains (*Schaffner*, 815).

"Much larger specimens than the original; the ascending or erect stems a foot high or less; leaflets linear to linear-oblong, two to six lines long."

[i. p. 268.] 1. **Nissolia fruticosa,** Jacq.

✓ Guatemala (*Bernoulli & Cario*, 1213). Hb. Kew.

[i. p. 268.] 3*. **Nissolia platycalyx,** S. Wats. in Proc. Am. Acad. xvii. p. 344.

North Mexico, in the mountains east of Saltillo (*Palmer*, 248, in part).

[i. p. 268.] *Nissolia platycarpa*, Benth., = **Chætocalyx schottii,** Torr.

[i. p. 268.] 4*. **Nissolia wislizeni,** A. Gr. in Journ. Linn. Soc. v. p. 25; S. Wats. in Proc. Am. Acad. xvii. p. 334.

Chætocalyx wislizenii, A. Gr. Pl. Wright. i. p. 51, et ii. p. 45; Torr. Bot. U. S. & Mex. Bound. Surv. p. 56, t. 18. figg. 5–7.

North Mexico, Sonora and Chihuahua (*Wright*), in the San Miguelito and San Rafael Mountains, San Luis Potosi (*Schaffner*, 793, 794), Santa Rosa, Coahuila (*Parry*).

[i. p. 272.] 2. **Stylosanthes guianensis,** Aubl.
Guatemala (*Bernoulli & Cario*, 1304). Hb. Kew.

[i. p. 272.] 3*. **Stylosanthes mucronata,** Willd. Sp. Pl. iii. p. 1166; DC. Prodr. ii. p. 318; S. Wats. in Proc. Am. Acad. xvii. p. 344.
North Mexico, in the San Miguelito Mountains (*Schaffner*, 800).
We had followed other botanists in reducing *S. mucronata*, Willd., to *S. procumbens*, Swartz, from which, according to Watson, it differs in its pubescence and in the form and size of its pod.

[i. p. 272.] 4. **Stylosanthes procumbens,** Swartz.
Guatemala (*Bernoulli & Cario*, 1215). Hb. Kew.

[i. p. 274.] 5. **Desmodium adscendens,** DC.
Guatemala (*Bernoulli & Cario*, 1295). Hb. Kew.

[i. p. 275.] 10*. **Desmodium axillare,** DC. Prodr. ii. p. 333; Griseb. Fl. Brit. W. Ind. p. 187.
Guatemala (*Bernoulli & Cario*, 1127).—Colombia to Peru and Brazil, and Cuba to Trinidad.

[i. p. 280.] 34. **Desmodium incanum,** DC.
Guatemala (*Bernoulli & Cario*, 1294). Hb. Kew.

[i. p. 283.] 45. **Desmodium molliculum,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 345.
North Mexico, in woods, San Rafael (*Schaffner*, 798).

[i. p. 287.] 62. **Desmodium psilophyllum,** Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 344.
North Mexico, Caracol Mountains, Coahuila (*Palmer*, 2136).

[i. p. 289.] 72. **Desmodium spirale,** DC.
Guatemala (*Bernoulli & Cario*, 1305). Hb. Kew.

[i. p. 291.] 83. **Desmodium viridiflorum,** Beck.; S. Wats. in Pr. Am. Acad. xvii. p. 344.
North Mexico, Caracol Mountains, Coahuila (*Palmer*, 246).

[i. p. 291.] 84. **Desmodium wislizenii,** Engelm.; S. Wats. in Proc. Am. Acad. xvii. p. 345.
North Mexico, near San Luis Potosi (*Schaffner*, 796, in part).

[i. p. 291.] 1*. **Lespedeza repens,** Barton; Torr. & A. Gr. Fl. N. Am. i. p. 367; S. Wats. in Proc. Am. Acad. xvii. p. 345.

Canada southward.—North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 249).

[i. p. 292.] 1*. **Vicia americana,** Muhl., var. **linearis,** S. Wats. in Proc. Am. Acad. xi. p. 134, et xvii. p. 345; Torr. & A. Gr. Fl. N. Am. i. p. 269.

Canada southward.—North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 247).

[i. p. 293.] 4. **Lathyrus parvifolius,** S. Wats. in Proc. Am. Acad. xvii. p. 345.

North Mexico, region of San Luis Potosi (*Schaffner*, 812; *Parry & Palmer*, 197). Hb. Kew.

We had doubtingly referred Parry and Palmer's plant to *L. venosus,* Muhl.

[i. p. 295.] 2. *Cologania angustifolia*, Kunth in part, = **C. martia,** S. Wats. in Proc. Am. Acad. xvii. p. 345.

North Mexico, region of San Luis Potosi (*Parry & Palmer*, 191, 193; *Schaffner*, 802). Hb. Kew.

The examination of a large number of specimens of this genus in Kew Herbarium led to the discovery that several of the species of this genus bear dimorphic flowers, and we were unable to reduce Zuccarini's *Martia* to any one species.

[i. p. 296.] 4*. **Cologania lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 74.

North Mexico, on the high mesas of the Chiricahui Mountains and the Huachuca Mountains (*Lemmon*).

[i. p. 296.] 5. **Cologania longifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 345.

North Mexico, Lerios, Coahuila (*Palmer*, 251).

[i. p. 296.] 5*. **Cologania martia,** S. Wats. in Proc. Am. Acad. xvii. p. 345.

Martia mexicana, Zucc. in Abhandl. Münch. Akad. i. p. 339, tt. 14 et 15.

[i. p. 298.] 2. **Erythrina coralloides,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 346.

North Mexico, mountains near San Luis Potosi (*Schaffner*, 96).

[i. p. 300.] 4*. **Mucuna (§ Carpopogon),** sp. n.

Guatemala (*Bernoulli & Cario*, 493). Hb. Kew.

[i. p. 301.] 1. **Galactia brachystachys,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 346.

North Mexico, Saltillo, Coahuila (*Palmer*, 252).

i. p. 303.] 2. **Canavalia obtusifolia,** DC.
Guatemala (*Bernoulli & Cario*, 1185). Hb. Kew.

[i. p. 303.] 4. **Canavalia villosa,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 346.
North Mexico, in the Caracol Mountains, south of Monclova, Coahuila (*Palmer*, 259).

[i. p. 304.] 5. **Phaseolus atropurpureus,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 346.
North Mexico, in the mountains north of Monclova (*Palmer*, 262).

[i. p. 306.] 23*. **Phaseolus (Drepanospron) polymorphus,** S. Wats. in Proc. Am. Acad. xvii. p. 346.
Phaseoli, spp. nn. 38 et 39, huj. op. i. p. 307.
North Mexico, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 186, 188). Hb. Kew.

[i. p. 306.] 25*. **Phaseolus (Drepanospron) scabrellus,** Benth. in Herb. Gray ex S. Wats. in Proc. Am. Acad. xvii. p. 346.
North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 2122), Sonora Alta (*Coulter*).

[i. p. 309.] 1. **Pachyrhizus angulatus,** Rich.
Guatemala (*Bernoulli & Cario*, 1162). Hb. Kew.

[i. p. 311.] 7. **Rhynchosia macrocarpa,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 347.
North Mexico, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 184), San Miguelito Mountains (*Schaffner*, 826); Guatemala (*Bernoulli & Cario*, 6249). Hb. Kew.

[i. p. 311.] 10. **Rhynchosia phaseoloides,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 347.
North Mexico, in the Santa Maria del Rio Mountains (*Schaffner*, 827).

[i. p. 313.] 6. **Eriosema violaceum,** G. Don.
Guatemala (*Bernoulli & Cario*, 1222). Hb. Kew.

[i. p. 326.] 3*. **Hoffmanseggia gracilis,** S. Wats. in Proc. Am. Acad. xvii. p. 437.
North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 275).

[i. p. 326.] 8. **Hoffmanseggia stricta,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 347.
North Mexico, Saltillo and Parras, Coahuila (*Palmer*, 267, 268).

[i. p. 334.] 59. **Cassia stenocarpa,** Vog.
GUATEMALA (*Bernoulli & Cario*, 1192). Hb. Kew.

[i. p. 335.] 67. **Cassia vogeliana,** Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 348.
NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 281).

[i. p. 337.] 7. **Bauhinia inermis,** Pers.
GUATEMALA (*Bernoulli & Cario*, 1311). Hb. Kew.

[i. p. 339.] 17. **Bauhinia ramosissima,** Benth. ?; S. Wats. in Proc. Am. Acad. xvii. p. 348.
NORTH MEXICO, Monclova, Coahuila (*Palmer*, 285).

[i. p. 340.] 1*. **Cercis reniformis,** Engelm.; Scheele, Rœm. Texas, p. 428; S. Wats. in Proc. Am. Acad. xvii. p. 348.
Cercis occidentalis, Torr., var. *texensis,* S. Wats. Bibl. Ind. N. Am. Pl. i. p. 209.
TEXAS.—NORTH MEXICO, in the Caracol Mountains, south of Monclova, Coahuila (*Palmer*).

[i. p. 343.] 1. **Entada polystachya,** DC.
GUATEMALA (*Bernoulli & Cario*, 1160). Hb. Kew.

[i. p. 343.] 2. **Piptadenia patens,** Benth.
GUATEMALA (*Bernoulli & Cario*, 1180). Hb. Kew.

i. p. 345, six lines from top, *for* plana *read* plena.

[i. p. 345.] 3. **Neptunia plena,** Benth.
GUATEMALA (*Bernoulli & Cario*, 1182). Hb. Kew.

[i. p. 345.] 2. **Desmanthus incurvus,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 349.
NORTH MEXICO, Parras, Coahuila, and in the Sierra Madre, south of Saltillo (*Palmer*, 314).

[i. p. 345.] 4. **Desmanthus virgatus,** Willd.
GUATEMALA (*Bernoulli & Cario*, 1184). Hb. Kew.

[i. p. 349.] 26*. **Mimosa lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 76.
NORTH MEXICO, in a cañon near Fort Huachuca, and in Cave Cañon (*Lemmon*).

[i. p. 349.] 31. **Mimosa monancistra,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 350.
NORTH MEXICO, Soledad, Coahuila (*Palmer*, 290).

[i. p. 350.] 39. **Mimosa strigillosa,** Torr. et A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 350.
NORTH MEXICO, Juraz, Coahuila (*Palmer*, 2115).

[i. p. 350.] 1. **Schrankia aculeata,** Willd., var. ?, S. Wats. in Proc. Am. Acad. xvii. p. 350.

NORTH MEXICO, in the Sierra Madre, south of Saltillo, and at Soledad, Coahuila (*Palmer*, 301).

[i. p. 351.] 3*. **Schrankia subinermis,** S. Wats. in Proc. Am. Acad. xvii. p. 350.

NORTH MEXICO, in the mountains north of Monclova, Coahuila (*Palmer*, 302).

[i. p. 351.] 3. **Leucæna glauca,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 350.

NORTH MEXICO, Saltillo (*Palmer*, 307).

[i. p. 352.] 6. **Acacia crassifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 351.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 284).

[i. p. 354.] 22*. **Acacia palmeri,** S. Wats. in Proc. Am. Acad. xvii. p. 350.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 298).

[i. p. 357.] 5*. **Calliandra coulteri,** S. Wats. in Proc. Am. Acad. xvii. p. 352.

NORTH MEXICO, Soledad (*Palmer*, 2129), without locality (*Coulter*).

[i. p. 358.] 19. **Calliandra portoricensis,** Benth.

GUATEMALA (*Bernoulli & Cario*, 1136). Hb. Kew.

[i. p. 359.] 6*. **Pithecolobium (Chloroleucon) elachistophyllum,** A. Gr. in herb., ex S. Wats. in Proc. Am. Acad. xvii. p. 352.

NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 289).

[i. p. 360.] 15. **Pithecolobium palmeri,** Hemsl.; S. Wats. in Proc. Am. Acad. xvii. p. 352.

NORTH MEXICO, in the San Miguelito Mountains (*Schaffner*, 625, in part).

Watson describes the pod, which we have not seen, as being stipitate and three or four inches long or more.

[i. p. 361.] 17*. **Pithecolobium (Chloroleucon) schaffneri,** S. Wats. in Proc. Am. Acad. xvii. p. 352.

Acacia, sp. 36, huj. op. i. p. 355.

NORTH MEXICO, in the mountains around San Luis Potosi (*Parry & Palmer*, 219; *Schaffner*, 628). Hb. Kew.

ROSACEÆ.

[i. p. 365.] 2. **Chrysobalanus icaco,** Linn.

GUATEMALA (*Bernoulli & Cario*, 2966). Hb. Kew.

[i. p. 368.] 3*. **Prunus glandulosa,** Torr. & A. Gr. Fl. N. Am. i. p. 408; S. Wats. in Proc. Am. Acad. xvii. p. 352.
Amygdalus glandulosa, Hook. Ic. Pl. t. 288.

TEXAS.—NORTH MEXICO, in the Sierra Madre south of Saltillo (*Palmer*, 2131).

[i. p. 368.] 4*. **Prunus mexicana,** S. Wats. in Proc. Am. Acad. xvii. p. 353.

NORTH MEXICO, Lerios, Coahuila (*Palmer*, 2130).

[i. p. 370.] 1. **Vauquelinia corymbosa,** Corr.; S. Wats. in Proc. Am. Acad. xvii. p. 353.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 329).

[i. p. 371.] 7. *Rubus humistratus*, Steud.,=22. **R. trivialis,** Michx. [i. p. 372]; S. Wats. in Proc. Am. Acad. xvii. p. 353.

[i. p. 376.] 4*. **Potentilla heptaphylla,** Mill. Dict. n. 9; DC. Prodr. ii. p. 586; Lehm. Revis. Potent. p. 76; S. Wats. in Proc. Am. Acad. xvii. p. 353.

NORTH MEXICO, Caracol Mountains, Coahuila (*Palmer*, 327).

Watson cites this European species without any remark. It is not included in his Bibliographical Index to North-American Botany.

[i. p. 376.] 5*. **Potentilla norvegica,** Linn. Sp. Pl. ed. i. p. 499; Torr. & A. Gr. Fl. N. Am. i. p. 436; S. Wats. in Proc. Am. Acad. xvii. p. 353.

ARCTIC REGIONS southward.—NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 328). Also in NORTHERN EUROPE and ASIA.

[i. p. 377.] 5*. **Alchemilla velutina,** S. Wats. in Proc. Am. Acad. xvii. p. 354.

NORTH MEXICO, in swampy places about San Luis Potosi (*Schaffner*, 870).

[i. p. 379.] *Rosa blanda*, Ait.

This species is certainly not found within our limits, and should therefore be cancelled. Watson (Proc. Am. Acad. xx. p. 340) only records it from Northern and Central States.

1*. **Rosa fendleri,** Crepin in Bull. Soc. Bot. Belg. xv. p. 452; S. Wats. in Proc. Am. Acad. xx. p. 344.

BRITISH COLUMBIA to CALIFORNIA and WESTERN TEXAS.—NORTH MEXICO, on the Mimbres (*Thurber*).

This may or may not be actually within our boundary.

2*. **Rosa mexicana,** S. Wats. in Proc. Am. Acad. xvii. p. 354, et xx. p. 349.

NORTH MEXICO, Caracol Mountains, Coahuila (*Palmer*, 2124).

In the last place cited is an admirable monograph of the American Roses by S. Watson, with full particulars of their distribution and synonymy. Eighteen species are admitted, and the above are the only native species recorded from Mexico; but two or three others may be expected to occur within our limits, as they have been found in the southern part of New Mexico and Arizona.

[i. p. 378.] *Rosa montezumæ*, H. B. K.

S. Watson, loc. cit. p. 351, states that there can be little doubt that this is a variety of *R. canina*, Linn., which exists only as a naturalized plant in North America.

[i. p. 380.] 1. **Cotoneaster denticulata,** H. B. K.; S. Wats. in Proc. Am. Acad. xvii. p. 354.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 330).

[i. p. 380.] 1*. **Cotoneaster nervosa,** Dcne. in Nouv. Archives du Mus. x. p. 177.

Mexico.

SAXIFRAGACEÆ.

[i. p. 384.] 4. **Philadelphus serpyllifolius,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 354.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*).

CRASSULACEÆ.

[i. p. 392.] 34*. **Cotyledon schaffneri,** S. Wats. in Proc. Am. Acad. xvii. p. 354.

North Mexico, mountains around San Luis Potosi (*Schaffner*, 768).

[i. p. 398.] 17*. **Sedum palmeri,** S. Wats. in Proc. Am. Acad. xvii. p. 355.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 2121).

[i. p. 399.] 20*. **Sedum stelliforme,** S. Wats. in Proc. Am. Acad. xx. p. 364.

New Mexico.—North Mexico, Huachuca Mountains (*Lemmon*).

HALORAGEÆ.

[i. p. 401.] 1. **Callitriche heterophylla,** Pursh, Fl. Am. Sept. i. p. 3; A. Gr. Manual, ed. 5, p. 429; S. Wats. in Proc. Am. Acad. xviii. p. 154.

Callitriche asagræi, Hegelm. Monogr. Callit. p. 54, t. 3. fig. 9, t. 4. fig. 1.

New York and Illinois southward.—North Mexico, near Morales, San Luis Potosi (*Schaffner*). Hb. Kew.

[i. p. 401.] 1*. **Callitriche austini,** Engelm.; A. Gr. Man. Bot. Northern U. S. ed. 5, p. 428; S. Wats. in Proc. Am. Acad. xviii. p. 154.

New York to Illinois and Missouri southward.—North Mexico, near Morales, San Luis Potosi (*Schaffner*).—And in South America.

COMBRETACEÆ.

[i. p. 403. 1. **Conocarpus erecta,** Linn., Hemsl. in Rep. Bot. Chall. Exped. i. p. 32.
GUATEMALA (*Bernoulli & Cario*, 3350). Hb. Kew.—Also found in the Bermudas.

MELASTOMACEÆ.

[i. p. 418.] 2. **Pterolepis ladanoides,** Tr. (*Rhexia pumila*, Bonpl. Rhex. t. 35).
GUATEMALA (*Bernoulli & Cario*, 2893). Hb. Kew.

[i. p. 430.] 1. **Heterotrichum octonum,** DC.
GUATEMALA (*Bernoulli & Cario*, 2875). Hb. Kew.

[i. p. 432.] 2. **Octopleura micrantha,** Griseb. (*Ossæa*, Macf. Fl. Jam. ii. p. 49).
GUATEMALA (*Bernoulli & Cario*, 2883). Hb. Kew.

[i. p. 434.] 2. **Mouriria parvifolia,** Benth. vide Griseb. Cat. Pl. Cub. p. 92.
GUATEMALA (*Bernoulli & Cario*, 3385). Hb. Kew.

LYTHRACEÆ.

[i. p. 436.] CUPHEA.

Koehne has published a second revision of this difficult genus in Engler's Bot. Jahrb. ii. (1882) pp. 136–176 and 395–424; and as the result of more extended observation and investigation, he considerably modifies the limits of some of the species. Two or three of the forms described by us as new species he has identified with previously described species, or regards as forms of such. Thus *C. anisophylla*, Hemsl., is referred, together with several other forms, including *C. orthodisca*, Koehne, to *C. calophylla*, Ch. et Schl., a very variable species extending into Brazil; the specimens we referred to his *C. palustris* he regards as *C. procumbens*, Cav.; *C. minuta* he reduces to a variety of *C. llavea; C. propinqua*, Hemsl., and *C. ternata*, Peyr., are referred to *C. heterophylla*, Benth.; and *C. dodecandra*, Hemsl. †, is the same as *C. subuligera*, Koehne. Further, there are three additional species.

[i. p. 438.] 6*. **Cuphea baillonis,** Koehne in Engler's Bot. Jahrb. iv. p. 401.
SOUTH MEXICO, in pine forests, Oaxaca (ex *Koehne*).

[i. p. 440.] 16*. **Cuphea elliptica,** Koehne in Engler's Bot. Jahrb. ii. p. 145, cum *β. oligostemone*.
MEXICO; PANAMA.

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† Koehne states the occurrence of twelve stamens is in the highest degree remarkable. Their existence in our plant was verified by two of our colleagues.

[i. p. 443.] 36*. **Cuphea micrantha,** H. B. K.; Koehne in Engler's Bot. Jahrb. ii. p. 142.

HONDURAS (ex *Koehne*).—CUBA; SAN DOMINGO; VENEZUELA to GUIANA and BRAZIL.

[i. p. 448.] 1*. **Nesæa longipes,** A. Gr. Pl. Wright. i. p. 68, et ii. p. 56; S. Wats. in Proc. Am. Acad. xvii. p. 356.

TEXAS.—NORTH MEXICO, Parras, Coahuila (*Palmer*, 333; *Gregg*).

ONAGRARIEÆ.

[i. p. 452.] 1. **Ludwigia palustris,** Linn.; S. Wats. in Proc. Am. Acad. xvii. p. 356.

NORTH MEXICO, near Morales, San Luis Potosi (*Schaffner*, 127).

[i. p. 453.] 4. **Œnothera brachycarpa,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 357.

NORTH MEXICO, Saltillo (*Palmer*, 342).

[i. p. 453.] 7*. **Œnothera (Megapterium) dissecta,** A. Gr. in herb. ex S. Wats. in Proc. Am. Acad. xvii. p. 357.

Œnothera, sp. n. 35, huj. op. i. p. 455.

NORTH MEXICO, sandy localities near San Luis Potosi (*Parry & Palmer*, 249; *Schaffner*, 168). Hb. Kew.

[i. p. 453.] 11. **Œnothera hartwegii,** Benth.; S. Wats. in Proc. Am. Acad. xvii. p. 357.

NORTH MEXICO, mountains east of Saltillo (*Palmer*, 337, 341).

[i. p. 454.] 15. **Œnothera macrosceles,** A. Gr.; S. Wats. in Proc. Am. Acad. xvii. p. 356.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 338).

[i. p. 454.] 22. **Œnothera speciosa,** Nutt.; S. Wats. in Proc. Am. Acad. xvii. p. 356.

Œnothera berlandieri et *Œ. hirsuta,* Walp.; huj. op. i. p. 453, fide Wats. l. c.

NORTH MEXICO, Caracol Mountains, Coahuila, and Monterey, Nuevo Leon (*Palmer*, 335, 336).

[i. p. 462.] HAUYA.

S. Watson (Proc. Am. Acad. xx. p. 366) describes a new species of this genus from Lower California, and states that it is very distinct from the Mexican.

[i. p. 465.] 17. **Lopezia pumila,** H. B. K.; S. Wats. in Proc. Am. Acad. xvii. p. 357.

NORTH MEXICO, near San Luis Potosi (*Schaffner*, 640).

[i. p. 467.] 7. **Gaura parviflora,** Dougl.; S. Wats. in Proc. Am. Acad. xvii. p. 357.

North Mexico, Saltillo (*Palmer*, 2119).

SAMYDACEÆ.

[i. p. 471.] 1. **Homalium racemosum,** Jacq.; Griseb. Fl. Brit. W. Ind. p. 298.

Guatemala (*Bernoulli & Cario*, 3373). Hb. Kew.

LOASEÆ.

[i. p. 472.] 1. **Cevallia sinuata,** Lag.; S. Wats. in Proc. Am. Acad. xvii. p. 358.

North Mexico, Saltillo and Parras, Coahuila and Monterey, Nuevo Leon (*Palmer*, 360, 361, 362).

[i. p. 472.] 1*. **Petalonyx crenatus,** A. Gr. in herb. ex S. Wats. in Proc. Am. Acad. xvii. p. 358.

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 833).

[i. p. 472.] 1*. **Mentzelia aspera,** Linn. Sp. Pl. ed. 1, p. 516; A. Gr. Proc. Am. Acad. v. p. 158 et 180; Griseb. Fl. Brit. W. Ind. p. 298; S. Wats. in Proc. Am. Acad. xvii. p. 359.

California to Texas.—North Mexico, at Soledad and in the mountains north of Monclova (*Palmer*, 351, 831).—West Indies and northern part of South America.

[i. p. 472.] 1**. **Mentzelia (Bicuspidaria) involucrata,** S. Wats. in Proc. Am. Acad. xx. p. 367.

California; Arizona.—North Mexico, north-western Sonora (*Pringle*).

[i. p. 472.] 2*. **Mentzelia multiflora,** A. Gr. Pl. Fendl. p. 48; Pl. Wright. i. p. 74, et ii. p. 59; S. Wats. in Proc. Am. Acad. xvii. p. 359.

New Mexico; Texas.—North Mexico, Saltillo and San Lorenzo de Laguna (*Palmer*, 350, 358, 359), Buena Vista (*Gregg*).

[i. p. 473.] 5. *Mentzelia strigosa*, H. B. K., = 1. **M. hispida,** Willd. fide S. Wats. in Proc. Am. Acad. xvii. p. 359.

North Mexico, Monclova, Soledad, and in the Caracol Mountains (*Palmer*, 352, 353, 357).

[i. p. 473.] 1*. **Loasa bicolor,** Klotzsch in Otto & Dietr. Allg. Gart. Zeit. xix. p. 361.

Panama, Volcan de Chiriqui (*Warscewicz*).

[i. p. 474.]

TURNERACEÆ.

See Urban in Jahrbuch des Kgl. Bot. Gard. und Mus. Berlin, ii. pp. 1–152, and reprint with two plates, where the following alterations are made :—

1. **Turnera cistoides,** Linn., = *Piriqueta cistoides*, Meyer.

5. **Turnera hindsiana,** Hemsl. in huj. op. i. p. 474, = *Turnera panamensis,* Urb. l. c. p. 92.

3*. **Turnera callosa,** Urb. l. c. p. 105.

SOUTH MEXICO, Cuernavaca (*Ghiesbreght*, 148, 219; *Bates*). Hb. Kew.

6. **Turnera humifusa,** Endl., = *T. diffusa*, Willd.

2. **Turnera aphrodisiaca,** L. F. Ward, = *T. diffusa*, var. *β. aphrodisiaca*, Urb.

11. **Turnera velutina,** Presl, = *T. ulmifolia*, Linn., var. *ζ. velutina*, Urb.

9. **Turnera trioniflora,** Sims, = *T. ulmifolia*, Linn., var. *δ. elegans*, Urb.

7. **Turnera mollis,** H. B. K., = *T. ulmifolia*, Linn., var.

1. **Turnera alba,** Liebm., = *T. ulmifolia*, Linn., var.

3. **Turnera cærulea,** DC., = *T. ulmifolia*, Linn., var. *μ. cærulea*, Urb.

[i. p. 476.] *Piriqueta odorata*, Urb. loc. cit. p. 80, = **Erblichia odorata,** Seem.

[i. p. 482.]

CUCURBITACEÆ.

This Order has been monographed by A. Cogniaux in De Candolle's 'Suites au Prodromus,' vol. iii.; and the additions and principal modifications are given below, with references to the pages in vol. i. of this work.

[i. p. 483.] 1*. **Luffa cylindrica,** Rœm. Syn. fasc. ii. p. 63; Cogn. in DC. Monogr. Phan. iii. p. 456.

Throughout the tropics of the Old World, and frequently cultivated and half wild in Tropical America.—MEXICO (*Liebmann*, 52; *Pavon; Bourgeau*, 3167), Yucatan (*Schott*, 6); NICARAGUA (*Œrsted*, 28; *Lévy*, 23).

[i. p. 483.] 2. **Cucumis melo,** Linn. Sp. Pl. ed. 1, p. 1011, ed. 2, p. 1436; Cogn. in DC. Monogr. Phan. iii. p. 482.

Cucumis campechianus, H. B. K. Nov. Gen. et Sp. ii. p. 122; huj. op. i. p. 483.

[i. p. 484.] 5*. **Sicana odorifera,** Naud. in Ann. Sc. Nat. ser. 4, vol. xviii. p. 181; Cogn. in DC. Monogr. Phan. iii. p. 522.

MEXICO (*Moçino & Sessé*).—COLOMBIA to PERU and BRAZIL, and in the WEST INDIES.

A monotypic genus.

[i. p. 483.] 1*. **Cucurbita galeottii,** Cogn. in DC. Monogr. Phan. iii. p. 551.

MEXICO, San Pedro Nolasco (*Galeotti*).

[i. p. 493.] 1*. **Schizocarpum liebmannii,** Cogn. in DC. Monogr. Phan. iii. p. 553.

Mexico, San Miguel (*Liebmann*), near Mexico (*Uhden*).

[i. p. 484.] 1*. **Melothria angustiloba,** Cogn. in DC. Monogr. Phan. iii. p. 579.

Mexico, Potrero (*Hahn*).

[i. p. 484.] 1**. **Melothria guadalupensis,** Cogn. in DC. Monogr. Phan. iii. p. 580.

Mexico (*Schiede*), Tampico de Tamaulipas (*Berlandier*).—West Indies and Guiana.

[i. p. 484.] 3 & 4. **Melothria fluminensis,** Gardn. in Hook. Journ. Bot. i. p. 173; Cogn. in DC. Monogr. Phan. iii. p. 583.

Apodanthera gracilis, Benth. Bot. Voy. Sulph. p. 99; huj. op. i. p. 486.

Mexico, Chinantla (*Galeotti*, 1880), San Martin (*Hahn*), Vera Cruz (*Gouin*); Central America (*Œrsted*), Granada (*Lévy*), San Juan de Nicaragua (*Friedrichsthal*); Costa Rica (*Hoffmann*); Panama (*Fendler*).—West Indies to Brazil and Paraguay.

Var. ε. **triangularis,** Cogn.

Mexico (*Pavon*).

[i. p. 484.] 4*. **Melothria pendula,** Linn. Sp. Pl. ed. 1, p. 35, ed. 2, p. 49; Cogn. in DC. Monogr. Phan. iii. p. 586.

Carolina to Texas; New Mexico.—Mexico (*Pavon*), Vera Cruz (*Wawra*), Cerra del Olomete (*Karwinsky*).—China.

[i. p. 484.] 2*. **Anguria trifoliata,** Linn. Sp. Pl. ed. 2, p. 1376; Cogn. in DC. Monogr. Phan. iii. p. 664.

Mexico (*Pavon*).—West Indies.

[i. p. 484.] 2. **Anguria pedata,** Jacq. Cogn. in DC. Monogr. Phan. iii. p. 665.

Var. γ. **affinis,** Cogn. l. c. p. 666.

Panama (*Duchassaing*).

[i. p. 484.] 4. **Anguria warscewiczii,** Hook. f.; Cogn. in DC. Monogr. Phan. iii. p. 667.

Costa Rica, Ayvacate (*Œrsted*), in addition to localities given.

[i. p. 485.] 1. **Maximowiczia lindheimeri,** Cogn. in DC. Monogr. Phan. iii. p. 727.

Sicydium lindheimeri, A. Gray, Pl. Lindh. ii. p. 194; huj. op. i. p. 485.

2. **Maximowiczia tripartita,** Cogn. in DC. Monogr. Phan. iii. p. 728.

Texas.—Mexico (*Edwards*).

[i. p. 486.] 9. CAYAPONIA.

Cayaponia, Manso, Enum. subst. Braz. p. 31; Cogn. in DC. Monogr. Phan. iii. p. 738.

Cogniaux enumerates sixty species, all but one African inhabiting Tropical America.

1. **Cayaponia alata,** Cogn. in DC. Monogr. Phan. iii. p. 746.
South Mexico, Yucatan, Hacienda Sara-Grossa (*Schott*).

2. **Cayaponia americana,** Cogn. in DC. Monogr. Phan. iii. p. 785.

Var. ε. **œrstedii,** Cogn. l. c. p. 787.
Central America (*Œrsted*); Nicaragua, Granada (*Œrsted*).—West Indies.

3. **Cayaponia attenuata,** Cogn. in DC. Monogr. Phan. iii. p. 770.
Trianosperma attenuata, Hemsl. in huj. op. i. p. 486.

4. **Cayaponia grandiflora,** Cogn. in DC. Monogr. Phan. iii. p. 779.
South Mexico, Yucatan, Picul (*Schott*).

5. **Cayaponia heterophylla,** Cogn. in DC. Monogr. Phan. iii. p. 758.
Guatemala, Mazatenango (*Bernoulli*).

6. **Cayaponia ?maximowiczii,** Cogn. in DC. Monogr. Phan. iii. p. 745.
Mexico (*Ervendberg; Liebmann*), Chiconamel (*Karwinski*), Misantla (*Hahn*).

7. **Cayaponia racemosa,** Cogn. in DC. Monogr. Phan. iii. p. 768.
Trianosperma racemosa, Hemsl. in huj. op. i. p. 486.

Var. ε. **scaberrima,** Cogn.
Costa Rica, San José (*Œrsted*), Ujaras (*Œrsted*).

Var. ζ. **palmatipartita,** Cogn.
Mexico (*Sartorius; Swartz*), Tampico (*Berlandier*), Cordova (*Bourgeau*); Nicaragua, Omotépé (*Lévy*).

Var. η. **microcarpa,** Cogn.
Mexico, Mirador (*Wawra; Liebmann*).

[i. p. 488.] 6*. **Elaterium trilobatum,** Schlecht. in Linnæa, xxiv. p. 639; Cogn. in DC. Monogr. Phan. iii. p. 861.
Mexico (*Schiede*).—Colombia.

[i. p. 489.] 1*. **Cyclanthera biglandulifera,** Cogn. in DC. Monogr. Phan. iii. p. 849.
Mexico (*Pavon*).

[i. p. 489.] 12. **Cyclanthera multifoliolata,** Cogn. *C. multifoliola,* Hemsl.

[i. p. 489.] 4. **Cyclanthera naudiniana,** Cogn. in DC. Monogr. Phan. iii. p. 832.
Cyclanthera dissecta, A. Gray (non Arn.); huj. op. i. p. 489.

[i. p. 490.] 12*. **Cyclanthera œrstedii,** Cogn. in DC. Monogr. Phan. iii. p. 856.
Costa Rica, San José (*Œrsted*), Catalina (*Œrsted*), Pacaca (*Œrsted*).

[i. p. 490.] 9 & 15. **Cyclanthera tamnoides,** Cogn. Diag. Cucurb. Nouv. fasc. ii. p. 64 ; Cogn. in DC. Monogr. Phan. iii. p. 848.

Cyclanthera hastata, Cogn. Diag. Cucurb. Nouv. fasc. ii. p. 64; DC. Monogr. Phan. iii. p. 848.

[i. p. 490.] 15*. **Cyclanthera trianæi,** Cogn. Diag. Cucurb. Nouv. fasc. ii. p. 75; Cogn. in DC. Monogr. Phan. iii. p. 844.

NEW GRANADA.

Var. β. **villosa,** Cogn.

MEXICO, Oaxaca (*Ghiesbreght*).

[i. p. 490.] 3, 4, & 7. **Sicyos deppei,** G. Don, Gen. Syst. iii. p. 34 ; Cogn. in DC. Monogr. Phan. iii. p. 876.

Sicyos microphyllus, H. B. K.

Sicyos vitifolius, Hook. et Arn.

[i. p. 490.] 5 & 6. **Sicyos laciniatus,** Linn. Sp. Pl. ed. 1, p. 1013, ed. 2, p. 1459; Cogn. in DC. Monogr. Phan. iii. p. 879.

Sicyos parviflorus, A. Gray, Pl. Wright. part ii. p. 62 (non Willd.).

Sicyos parvifolius, A. Gray, ex Naud. in Ann. Sc. Nat. ser. 5, vi. p. 22.

[i. p. 490.] 3*. **Sicyos galeottii,** Cogn. in DC. Monogr. Phan. iii. p. 883.

MEXICO, Oaxaca (*Galeotti*).

[i. p. 490.] 2. **Sicyos parviflorus,** Willd. Sp. Pl. iv. p. 626 ; Cogn. in DC. Monogr. iii. p. 885.

Sicyos depauperatus, Naud. in Ann. Sc. Nat. ser. 5, vi. p. 23; huj. op. i. p. 490.

[i. p. 491.] 1. **Sicydium schiedeanum,** Schlecht. in Linnæa, vii. p. 388 ; Cogn. in DC. Monogr Phan. iii. p. 904.

MEXICO, Hacienda de la Laguna (*Schiede*), Vera Cruz, near Mirador (*Sartorius*).

[i. p. 491.] 2. **Sicydium tamnifolium,** Cogn. in DC. Monogr. Phan. iii. p. 906.

Triceratia bryonioides, A. Rich. Fl. Cub. p. 614; huj. op. i. p. 491.

ECUADOR; NEW GRANADA; VENEZUELA.—PANAMA (*S. Hayes*, 191; *Seemann*); COSTA RICA (*Hoffmann*); NICARAGUA (*Lévy*, 279); SOUTH MEXICO, Yucatan, Tiop (*Linden*, 987 ; *Schott*), Ballam (*Pavon*), Campeche (*Linden*).—CUBA.

[i. p. 491.] 1. **Microsechium helleri,** Cogn. in DC. Monogr. Phan. iii. p. 910.

Sicyos helleri, Peyritsch in Linnæa, xxx. p. 56.

Sicyos scaberrimus, Galeotti in Linnæa, xxx. p. 57.

Microsechium ruderale, Naud. in Ann. Sc. Nat. ser. 5, vi. p. 25.

Microsechium guatemalense, Hemsley, Diag. Pl. Nov. pars i. p. 16.

[i. p. 492.] 2. **Microsechium palmatum,** Cogn. in DC. Monogr. Phan. iii. p. 911.

Sicyos palmata, Moç. et Sessé, Fl. Mex. Ic. ined. tab. 355.

Sechium palmatum, Ser. in DC. Prod. iii. p. 313.

Microsechium ruderale, Naud. in Ann. Sc. Nat. ser. 5, vi. p. 25; huj. op. i. p. 492.

[i. p. 493.] **Feuillea cordifolia,** Linn. Sp. Pl. ed. 1, i. p. 1013; Cogn. in DC. Monogr. Phan. iii. p. 941.

Var. β. **hederacea,** Cogn.

MEXICO (*Pavon*; *Moçino* et *Sessé*).—W. INDIES; and COLOMBIA to PERU.

Feuillea is an exclusively American genus of about six species.

ACTACEÆ.

[i. p. 502.] 4*. **Mamillaria acifer,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 109.

MEXICO (ex *Jacobi*).

[i. p. 505.] 31*. **Mamillaria canescens,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 89.

MEXICO? (*Galeotti*).

[i. p. 506.] 43. **Mamillaria conoidea,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 360.

NORTH MEXICO, Saltillo (*Palmer*, 378).

[i. p. 507.] 56*. **Mamillaria decora,** Fœrst. in Hamb. Gart. Zeit. xvii. p. 159.

MEXICO.

[i. p. 507.] 58*. **Mamillaria diacentra,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 91.

MEXICO?

[i. p. 513.] 120**. **Mamillaria lamprochæta,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 82.

MEXICO.

[i. p. 514.] 142. **Mamillaria micromeris,** Engelm.; S. Wats. in Proc. Am. Acad. xvii. p. 360.

NORTH MEXICO, Saltillo (*Palmer*).

[i. p. 515.] 144*. **Mamillaria monocentra,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 90.

MEXICO?

[i. p. 516.] 159*. **Mamillaria odieriana,** β. **subcurvata,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 83.

[i. p. 516.] 162*. **Mamillaria palmeri,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 82.

MEXICO?

[i. p. 518.] 172***. **Mamillaria plinthimorpha,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 92.

MEXICO (*Galeotti*).

[i. p. 518.] 179*. **Mamillaria potosiana,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 92.
NORTH MEXICO, San Luis Potosi (ex *Jacobi*).

[i. p. 518.] 179**. **Mamillaria porphyracantha,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 81.
MEXICO?

[i. p. 520.] 195. **Mamillaria radians,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, in the mountains west of Saltillo (*Palmer*).

[i. p. 521.] 203*. **Mamillaria rhodantha,** ε. **centrispina,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 83.

[i. p. 522.] 210*. **Mamillaria sanguinea,** Regel. Descr. Pl. Nov. fasc. viii. (1883), p. 8, et Gartenflora, xxxii. p. 66, t. 1111.
MEXICO. Imported and cultivated by Haage of Erfurt.

[i. p. 525.] 244*. **Mamillaria sulcoglandulifera,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. xxiv. p. 92.
NORTH MEXICO, San Luis Potosi (ex *Jacobi*).

[i. p. 526.] 267*. **Mamillaria webbiana,** β. **longispina,** Jacobi in Otto & Dietr. Allg. Gart. Zeit. p. 83.

[i. p. 529.] 10. **Echinocactus bicolor,** Gal.?; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, at Saltillo (*Palmer*, 379).

[i. p. 532.] 50. **Echinocactus horizonthalionis,** Lem.; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, at Saltillo (*Palmer*, 380).

[i. p. 534.] 65. **Echinocactus longehamatus,** Gal.; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, Saltillo (*Palmer*).

[i. p. 536.] 88. **Echinocactus pilosus,** Gal.; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, in the mountains east of Saltillo (*Palmer*, 375).

[i. p. 541.] 13. **Cereus cinerascens,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 360.
NORTH MEXICO, San Lorenzo de Laguna, Parras and Saltillo (*Palmer*, 369, 370, 371).

[i. p. 543.] 39*. **Cereus linnæi,** Fœrst. in Hamb. Gart. Zeit. xvii. p. 165.
MEXICO.

[i. p. 544.] 43*. **Cereus maritimus,** M. E. Jones in Amer. Nat. xvii. (1883), p. 933.

North Mexico, Encinada (*Jones*).

[i. p. 544.] 48*. **Cereus (Lepidocereus) pringlei,** S. Wats. in Proc. Am. Acad. xx. p. 368.

North Mexico, south of the Altar River, north-western Sonora (*Pringle*).

[i. p. 551.] 28. **Opuntia imbricata,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 360.

North Mexico, Parras, Coahuila (*Palmer*, 377).

[i. p. 552.] 30. **Opuntia kleiniæ,** DC.; S. Wats. in Proc. Am. Acad. xvii. p. 360

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 376).

UMBELLIFERÆ.

[i. p. 558.] 5. **Hydrocotyle prolifera,** Kellog; S. Wats. in Proc. Am. Acad. xvii. p. 360.

Watson considers Parry and Palmer's 1068 and Coulter's 107, referred by us to *H. interrupta*, to belong to this species.

[i. p. 560.] 6. **Eryngium carlinæ,** Delar.; S. Wats. in Proc. Am. Acad. xvii. p. 361.

North Mexico, near San Luis Potosi (*Schaffner*, 6).

Watson also refers Parry and Palmer's 286 to this species; we have it under *E. wrightii.*

[i. p. 561.] 10. **Eryngium deppeanum,** Cham. et Schl.; S. Wats. in Proc. Am. Acad. xvii. p. 360.

North Mexico, in woods near Morales (*Schaffner*, 8), region of San Luis Potosi (*Parry & Palmer*, 285).

We had referred this number of Parry & Palmer's to *E. aquaticum.*

[i. p. 561.] 21. **Eryngium nasturtiifolium,** Juss.; S. Wats. in Proc. Am. Acad. xvii. p. 360.

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 384).

[i. p. 562.] 32*. **Eryngium yuccæfolium,** Michx. var.?; S. Wats. in Proc. Am. Acad. xvii. p. 360.

North Mexico, in the Caracol Mountains south-east of Monclova (*Palmer*, 417).

[i. p. 565.] 1*. **Eulophus texanus,** Benth. et Hook. f. Gen. Pl. i. pp. 882 et 885; S. Wats. in Proc. Am. Acad. xvii. p. 361.

Tauschia texana, A. Gr. Pl. Lindh. p. 211, et Pl. Wright. i. p. 79.

TEXAS.—NORTH MEXICO, Lerios, Coahuila (*Palmer*, 386).

[i. p. 566.] 3*. **Apium popei,** A. Gr. in Proc. Am. Acad. vii. p. 343; S. Wats. in Proc. Am. Acad. xvii. p. 361.

Ammoselinum popei, Torr. & A. Gr. Pacif. Railr. Rep. ii. p. 165.

TEXAS.—NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 2109 in part).

[i. p. 569.] 1. **Angelica mexicana,** Vatke; S. Wats. in Proc. Am. Acad. xvii. p. 361.

Peucedanum spp. nn. 3 et 7, Biol. Centr.-Am., Bot. i. p. 570, fide Wats.

SOUTH MEXICO, valley of Mexico (*Bourgeau*, 316, 571). Hb. Kew.

[i. p. 570.] 1*. **Peucedanum mexicanum,** S. Wats. in Proc. Am. Acad. xvii. p. 361.

NORTH MEXICO, near Morales (*Schaffner*, 4), region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 288). Hb. Kew.

ARALIACEÆ.

[i. p. 574.] 15. **Oreopanax xalapense,** Planch. et Dcne.

On the authority of Seemann (Journ. Bot. vii. p. 351), *Monopanax ghiesbreghtii*, Regel, Gartenfl. 1869, p. 35, t. 606, is a synonym of this.

CAPRIFOLIACEÆ.

[ii. p. 2.] 9. **Viburnum membranaceum,** Hemsl.; S. Wats. in Proc. Am. Acad. xviii. p. 96.

NORTH MEXICO, Caracol Mountains, Coahuila (*Palmer*, 388).

[ii. p. 4.] 1. **Symphoricarpus microphyllus,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 96.

NORTH MEXICO, in the Sierra Madre south of Saltillo and at Lerios east of that city (*Palmer*, 390).

[ii. p. 5.] 1*. **Lonicera albiflora,** Torr. & A. Gr. Fl. N. Am. ii. p. 6.

ARKANSAS; TEXAS.—NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 389).

[ii. p. 5.] 2*. **Lonicera involucrata,** Banks; Torr. & A. Gr. Fl. N. Am. ii. p. 9; S. Wats. in Proc. Am. Acad. xviii. p. 96.

Watson states that *L. mociniana*, DC., is doubtless this species, which inhabits North America from Saskatchewan southward to California.

RUBIACEÆ.

[ii. p. 29.] 5*. **Oldenlandia ovata,** S. Wats. in Proc. Am. Acad. xviii. p. 97.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 399), region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 676½). Hb. Kew.

[ii. p. 31.] **Houstonia (Ereicotis) acerosa,** A. Gr. in Proc. Am. Acad. xvii. p. 203, in nota; S. Wats. in Proc. Am. Acad. xviii. p. 98.
Mallostoma acerosa, Hemsl. huj. op. ii. p. 31.

North Mexico, in the Caracol Mountains, at Soledad, and at Juraz, Coahuila, and from the Sierra Madre, south of Saltillo (*Palmer*, 400, 401, 402, 403). Hb. Kew.

We follow Dr. Gray in finally referring this plant to *Houstonia*.

[ii. p. 29.] 1. **Houstonia angustifolia,** Michx.; S. Wats. in Proc. Am. Acad. xviii. p. 97.

North Mexico, Monterey, Nuevo Leon (*Palmer*, 2116), San Miguelito Mountains (*Schaffner*, 614).

Var. **scabra,** S. Wats. l. c.

North Mexico, Caracol Mountains, south of Monclova, Coahuila (*Palmer*, 410).

[ii. p. 30.] 3*. **Houstonia (Ereicotis) fasciculata,** A. Gr. in Proc. Am. Acad. xvii. p. 203; S. Wats. in Proc. Am. Acad. xviii. p. 98.

Texas.—North Mexico, in the mountains north-east of Monclova and at Saltillo, Coahuila (*Palmer*, 404, 406).

[ii. p. 30.] 5*. **Houstonia palmeri,** A. Gr. in Proc. Am. Acad. xvii. p. 202; S. Wats. in Proc. Am. Acad. xviii. p. 97.

North Mexico, Lerios, east of Saltillo, and in the Sierra Madre, south of Saltillo (*Palmer*, 397, 398). Hb. Kew.

[ii. p. 39.] 1*. **Basanacantha ? reticulata,** S. Wats. in Proc. Am. Acad. xviii. p. 98.

North Mexico, San Lorenzo la Laguna, Coahuila (*Palmer*, 393).

[ii. p. 40.] 7. **Randia xalapensis,** Mart. et Gal.; S. Wats. in Proc. Am. Acad. xviii. p. 98.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 158).

[ii. p. 41.] 1. **Genipa caruto,** H. B. K.

Guatemala (*Bernoulli & Cario*, 1645). Hb. Kew.

[ii. p. 42.] 1*. **Machaonia fasciculata,** A. Gr. in Proc. Am. Acad. xix. p. 77.

Mexico (*Coulter*, 1167).

[ii. p. 48.] 6*. **Psychotria chontalensis,** Seem. Flore des Serres, sub t. 1938.

Nicaragua, Chontales (*Seemann*).

[ii. p. 48.] 8*. **Psychotria cyanococca,** Seem.; Fl. Mag. t. 479, copied in Flore des Serres, t. 1938.

NICARAGUA, Chontales (*Seemann*).

[ii. p. 56.] 9. **Diodia tetracocca,** Hemsl.; A. Gr. in Proc. Am. Acad. xix. p. 78.

Dr. Gray finds this not specifically different from his *D. tricocca*, and refers both forms to the genus *Crusea* under the name of *C. allococca*, A. Gr.

ii. p. 57, line 12 from top, add DC. after *Crusea coccinea*.

ii. p. 57, line 7 from bottom, for *subulata* read *subalata*.

[ii. p. 60.] 23. **Spermacoce subulata,** Pav.; A. Gr. in Proc. Am. Acad. xix. p. 78.

Dr. Gray refers this to the genus *Crusea*.

[ii. p. 61.] 1. **Mitracarpum breviflorum,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 98.

NORTH MEXICO, valley of San Luis Potosi (*Schaffner*, 1035).

[ii. p. 62.] 1. **Galium (Relbunium) aschenbornii,** Schauer in Linnæa, xx. p. 701; S. Wats. in Proc. Am. Acad. xviii. p. 99.

NORTH MEXICO, in the San Miguelito Mountains, San Luis Potosi (*Schaffner*, 841), without locality (*Aschenborn*).

[ii. p. 65.] 12. **Galium obstipum,** Schl.

GUATEMALA (*Bernoulli & Cario*, 1653). Hb. Kew.

[ii. p. 66.] 14. **Galium proliferum,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 99.

TEXAS.—NORTH MEXICO, Guajuco, Nuevo Leon (*Palmer*, 411).

VALERIANACEÆ.

[ii. p. 68.] 10*. **Valeriana mikania,** Lindl. in Journ. Hort. Soc. Lond. iii. p. 316.

GUATEMALA. Raised from seeds among the rubbish received with Mr. Skinners's Guatemala Orchids.

[ii. p. 69.] 24. **Valeriana,** sp. (*Astrephia mexicana*, Seem. nec Hook. et Arn. =19. **Valeriana sorbifolia,** H. B. K. fide S. Wats. in Proc. Am. Acad. xviii. p. 99.

COMPOSITÆ.

[ii. p. 71.] 15*. **Vernonia ervendbergii,** A. Gr. in Proc. Am. Acad. xvii. p. 203; S. Wats. in op. cit. xviii. p. 100.

Vernonia liatroides, A. Gr. in op. cit. v. p. 181, excl. syn. et pl. Coult.

North Mexico, Soledad, Coahuila (*Palmer,* 750); South Mexico, Tantoyuca (*Ervendberg*). Hb. Kew.

[ii. p. 72.] 17*. **Vernonia greggii,** A. Gr. in Proc. Am. Acad. xvii. p. 204; S. Wats. in op. cit. xviii. p. 100.

North Mexico, without locality (*Gregg,* 102).

Var. **palmeri,** A. Gr. l. c.

North Mexico, Lerios, Coahuila (*Palmer,* 753).

[ii. p. 74.] 36*. **Vernonia schaffneri,** A. Gr. in Proc. Am. Acad. xvii. p. 204; S. Wats. in op. cit. xviii. p. 100.

North Mexico, mountains near Morales, San Luis Potosi (*Schaffner,* 347).

[ii. p. 76.] 1. **Elephantopus angustifolius,** Swartz.

Guatemala (*Bernoulli & Cario,* 1625). Hb. Kew.

[ii. p. 76.] 1*. **Elephantopus cuneifolius,** Fournier in Bull. Soc. Bot. France, Comptes Rendus des Séances, xxx. (1883), p. 186.

South Mexico, common about Cordova (*Kerber*).

[ii. p. 81.] 6. **Ageratum corymbosum,** Zuccag.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

North Mexico, Saltillo and Monclova, Coahuila (*Palmer,* 427, 428).

[ii. p. 84.] **Stevia amabilis,** Lemmon; A. Gr. in Proc. Am. Acad. xix. p. 1.

North Mexico, Cave Cañon, Arizona (*Lemmon*).

[ii. p. 84.] 3. **Stevia berlandieri,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

North Mexico, Guajuco, Nuevo Leon (*Palmer,* 432).

[ii. p. 85.] 16. **Stevia eupatoria,** Willd.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

Stevia purpurea, Lag., fide Watson.

North Mexico, Lerios, Coahuila (*Palmer,* 433).

[ii. p. 88.] 48. **Stevia paniculata,** Lag.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

North Mexico, Parras, Coahuila (*Palmer,* 439).

[ii. p. 89.] 58. **Stevia salicifolia,** Cav.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

NORTH MEXICO, Coahuila (*Palmer*, 431).

[ii. p. 92.] 14. **Eupatorium azureum,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

NORTH MEXICO, Guajuco and Monterey, Nuevo Leon (*Palmer*, 434, 437, 438).

[ii. p. 93.] 20. **Eupatorium betonicum,** Hemsl.; S. Wats. in Proc. Am. Acad. xviii. p. 100.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 425).

[ii. p. 93.] 29*. **Eupatorium (Phanerostylis) coahuilense,** A. Gr. in Proc. Am. Acad. xvii. p. 205; S. Wats. in op. cit. xviii. p. 101.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 453).

[ii. p. 96.] 54*. **Eupatorium incarnatum,** Walt. Carol. p. 200; Torr. & A. Gr. Fl. N. Am. ii. p. 90; S. Wats. in Proc. Am. Acad. xviii. p. 100.

SOUTH CAROLINA to FLORIDA and TEXAS.—NORTH MEXICO, in the Caracol Mountains, Coahuila (*Palmer*, 429).

[ii. p. 96.] 65. **Eupatorium ligustrinum,** DC. Prodr. v. p. 181; Vatke in Regel's Gartenflora, xxii. p. 36 (varietates α et β).

Eupatorium myriadenium, Schauer in Linnæa, xix. p. 721.
Eupatorium weinmannianum, Regel et Koern. in Ind. Sem. Hort. Petrop. 1857, p. 41.

This plant has long been cultivated in European gardens under various names. Vatke (*l. c.*) enumerates the following:—*Eupatorium glabrum*, *E. glaucum*, *E. album*, *E. odoratum*, *E. odoratissimum*, *E. roseum*, *E. morisii*, *Ageratum glaucum*, *A. album*; also the following:—*Eupatorium biceps*, Klotzsch, MS. in herb. reg. Berol.; *E. gabellum*, Otto, MS. in herb. reg. Berol.; *E. iodopappum*, Schz. Bip. MS.

[ii. p. 97.] 74. **Eupatorium micranthum,** Less.,=*E. ligustrinum*, DC.; Vatke in Ind. Sem. Hort. Berol., App. 1872, p. 4.

This appears to be the oldest appellation for this much-named species.

[ii. p. 98.] 80*. **Eupatorium oaxacanum,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 4).

SOUTH MEXICO, mountains of Oaxaca (*E. Cuming*).

[ii. p. 98.] 92. **Eupatorium petiolare,** Moç.; S. Wats. in Proc. Am. Acad. xviii. p. 101.

NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 440).

[ii. p. 100.] 113*. **Eupatorium serotinum,** Michx. Fl. Bor.-Am. ii. p. 100; Torr. & A. Gr. Fl. N. Am. ii. p. 89; S. Wats. in Proc. Am. Acad. xviii. p. 100.

NORTH CAROLINA and ILLINOIS to FLORIDA and TEXAS.—NORTH MEXICO, without locality (*Palmer*, 424).

[ii. p. 102.] 133*. **Eupatorium tulanum,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 3).
SOUTH MEXICO, Tula to Tampico (*Berlandier*, 2139).

[ii. p. 102.] 135*. **Eupatorium vernale,** Vatke et Kurtz in Ind. Sem. Hort. Bot. Berol., App. 1871, p. 2; Regel's Gartenflora, xxii. p. 36, t. 750.
MEXICO?

[ii. p. 102.] 2. **Barroetea subuligera,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 101.
NORTH MEXICO, Soledad, Coahuila (*Palmer*, 452).

[ii. p. 103.] 4*. **Mikania fendleri,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 5).
PANAMA, Chagres (*Fendler*, 151). Probably not different from *M. gonoclada*.

[ii. p. 105.] 5. **Brickellia coulteri,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 101.
NORTH MEXICO, Parras, Coahuila (*Palmer*, 451).

[ii. p. 106.] 14*. **Brickellia odontophylla,** A. Gr. in Proc. Am. Acad. xvii. p. 206; S. Wats. in op. cit. xviii. p. 101.
NORTH MEXICO, in the Sierra Madre south of Saltillo (*Palmer*, 442).

[ii. p. 108.] 1. **Kuhnia rosmarinifolia,** Vent. Hort. Cels. t. 91; DC. Prodr. v. p. 126; S. Wats. in Proc. Am. Acad. xviii. p. 101.
Eupatorium canescens, Ort. Dec. p. 34.
CUBA.—NORTH MEXICO, Coahuila (*Palmer*).

[ii. p. 108.] 1. **Liatris punctata,** Hook.; S. Wats. in Proc. Am. Acad. xviii. p. 101.
NORTH MEXICO, in the Caracol Mountains, at Monclova and Juraz, Coahuila (*Palmer*, 418, 419, 420).

[ii. p. 111.] 33*. GREENELLA.

Greenella, A. Gr. in Proc. Am. Acad. xvi. p. 81.

This genus comes between *Xanthocephalum* and *Gutierrezia*. One other species, *G. arizonica*, is known: it may also grow south of the Gila.

[ii. p. 111.] 1. **Greenella discoidea,** A. Gr. in Proc. Am. Acad. xix. p. 2.
NORTH MEXICO, Tanner's Cañon, Huachuca (*Lemmon*).

[ii. p. 112.] 5. **Gutierrezia microcephala,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 101.

NORTH MEXICO, San Lorenzo de Laguna, and at Saltillo, Coahuila (*Palmer*, 460, 463).

[ii. p. 112.] 2*. **Grindelia arizonica,** A. Gr. in Proc. Am. Acad. xvii. p. 208; S. Wats. in op. cit. xviii. p. 101.

ARIZONA.—NORTH MEXICO, Coahuila (*Palmer*, 467).

[ii. p. 112.] 2**. **Grindelia costata,** A. Gr. in Proc. Am. Acad. xvii. p. 208; S. Wats. in op. cit. xviii. p. 102.

NORTH MEXICO, near Juraz in Coahuila, 100 miles north of Monclova (*Palmer*, 472).

[ii. p. 113.] 2*. **Heterotheca lamarckii,** Cass. Dict. xxi. p. 130; DC. Prodr. v. p. 317; S. Wats. in Proc. Am. Acad. xviii. p. 102.

Heterotheca scabra, DC. Prodr. v. p. 317; Torr. & A. Gr. Fl. N. Am. ii. p. 251.

SOUTH CAROLINA westward and southward.—NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 481).

[ii. p. 114.] 3*. **Chrysopsis villosa,** Nutt., var. **canescens,** A. Gr.; Torr. & Gr. Fl. N. Am. ii. p. 256 (species); S. Wats. in Proc. Am. Acad. xviii. p. 102.

TEXAS.—NORTH MEXICO, Lerios, Coahuila (*Palmer*, 480).

[ii. p. 115.] 1*. **Bigelovia drummondii,** A. Gr., var.?; S. Wats. in Proc. Am. Acad. xviii. p. 102.

TEXAS.—NORTH MEXICO, Soledad, Coahuila (*Palmer*, 485).

[ii. p. 115.] 5. **Bigelovia veneta,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 102.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 483).

[ii. p. 116.] 3*. **Solidago nemoralis,** Ait., var. **incana,** A. Gr. in Proc. Am. Acad. xv. p. 197; S. Wats. in Proc. Am. Acad. xviii. p. 102; Torr. & A. Gr. Fl. N. Am. ii. p. 221 (species).

CANADA southward.—NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 489).

[ii. p. 117.] 1. **Aphanostephus humilis,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 102.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 529).

[ii. p. 118.] 2. **Aphanostephus ramosissimus,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 102.

NORTH MEXICO, Juraz, Coahuila (*Palmer*, 532).

[ii. p. 118.] 1. **Distasis modesta,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 102.

NORTH MEXICO, in various localities (*Palmer*, 500, 603, 508).

[ii. p. 119.] 2. **Psilactis brevilingulata,** Schultz Bip.; S. Wats. in Proc. Am. Acad. xviii. p. 102.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 515, 528).

[ii. p. 121.] 4. **Aster divaricatus,** Nutt.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, Saltillo, Coahuila (*Palmer*, 526).

[ii. p. 123.] 1*. **Erigeron arizonicus,** A. Gr. in Proc. Am. Acad. xix. p. 2.

North Mexico, Tanner's Cañon, Huachuca (*Lemmon*).

[ii. p. 124.] 9*. **Erigeron lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 2.

North Mexico, Tanner's Cañon, Huachuca (*Lemmon*).

[ii. p. 124.] 14*. **Erigeron dryophyllus,** A. Gr. in Proc. Am. Acad. xvii. p. 210.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 495).

[ii. p. 125.] 15. **Erigeron palmeri,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, Saltillo and Lerios, Coahuila (*Palmer*, 496).

[ii. p. 125.] 16. **Erigeron pubescens,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, in various localities (*Palmer*, 530, 531, 2074).

[ii. p. 128.] 2. **Baccharis angustifolia,** Michx.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, Parras, Coahuila (*Palmer*, 541, 542).

[ii. p. 128.] 4. **Baccharis bigelovii,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 537).

[ii. p. 131.] 28. **Baccharis pteronioides,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

Baccharis ramulosa, A. Gr.; huj. op. ii. p. 131, fide S. Wats.

North Mexico, without locality (*Palmer*, 513, 514).

[ii. p. 132.] 42*. **Baccharis thomasii,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 6).

South Mexico, Orizaba (*Thomas*, 1866).

[ii. p. 133.] 1*. **Pluchea camphorata,** DC. Prodr. v. p. 452; A. Gr. Man. Bot. Northern U. S. ed. 5, p. 247; S. Wats. in Proc. Am. Acad. xviii. p. 103.

Massachusetts southward.—North Mexico, in the mountains north of Monclova, Coahuila (*Palmer*, 544).

[ii. p. 133.] 3. **Pluchea odorata,** Cass.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, Monterey, Nuevo Leon (*Palmer*, 545).

[ii. p. 133.] 5. **Pluchea subdecurrens,** DC., var. **canescens,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, Monterey, Nuevo Leon (*Palmer*, 546).

[ii. p. 135.] 1*. **Gnaphalium arizonicum,** A. Gr. in Proc. Am. Acad. xix. p. 3.

North Mexico, near Fort Huachuca (*Lemmon*).

[ii. p. 137.] 3*. **Gnaphalium bourgovii,** A. Gr. in Proc. Am. Acad. xix. p. 3.

South Mexico, valley of Cordova (*Bourgeau*, 1852).

[ii. p. 137.] 16. **Gnaphalium oxyphyllum,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 551).

[ii. p. 137.] 16*. **Gnaphalium pannosum,** A. Gr. in Proc. Am. Acad. xix. p. 3.

North Mexico, region of San Luis Potosi, 6000 to 8000 feet (*Parry & Palmer*, 420; *Schaffner*, 227). Hb. Kew.

✓ [ii. p. 137.] 17. **Gnaphalium polycephalum,** Michx.

Guatemala (*Bernoulli & Cario*, 1506 *a*). Hb. Kew.

[ii. p. 137.] 18. **Gnaphalium purpurascens,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, Coahuila (*Palmer*, 2017).

Watson reduces *G. schraderi*, DC., to this species, and suggests that it may be the same as *G. roseum*, H. B. K. There still remains much to be done in limiting the species of *Gnaphalium* coming within our area.

[ii. p. 137.] 22. **Gnaphalium semiamplexicaule,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, in the Caracol Mountains, Coahuila (*Palmer*, 553).

[ii. p. 138.] 25. **Gnaphalium sprengelii,** Hook. et Arn.; S. Wats. in Proc. Am. Acad. xviii. p. 103.

North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 548, 552).

✓ [ii. p. 144.] 2. **Baltimora scolopospermum,** Steetz.

Guatemala (*Bernoulli & Cario*, 1558). Hb. Kew.

[ii. p. 144.] 1. **Dicranocarpus parviflorus,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, Monclova (*Palmer*, 641).

[ii. p. 148.] 1. **Parthenium argentatum,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, without locality (*Palmer*, 566, 646).

[ii. p. 148.] 1*. **Parthenium confertum,** A. Gr. in Proc. Am. Acad. xvii. p. 216; S. Wats. in op. cit. xviii. p. 104.

North Mexico, Coahuila (*Palmer*, 648), Parras (*Gregg*).

[ii. p. 148.] 3. **Parthenium hysterophorus,** Linn.

Guatemala (*Bernoulli & Cario*, 1421). Hb. Kew.

[ii. p. 148.] 4*. **Parthenium lyratum,** A. Gr. ined.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, without locality (*Palmer*, 647).

[ii. p. 149.] 1*. **Iva ambrosiæfolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, without locality (*Palmer*, 573, 574).

[ii. p. 149.] 2. **Iva dealbata,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, at Soledad and Monclova (*Palmer*, 737, 738).

[ii. p. 152.] 1. **Zinnia acerosa,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, Coahuila (*Palmer*, 577, 578).

[ii. p. 153.] 3. **Zinnia anomala,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 105.

North Mexico, Sierra Madre, south of Saltillo (*Palmer*, 581).

[ii. p. 153.] 8. **Zinnia juniperifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 104.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 576).

[ii. p. 155.] 3. **Sanvitalia angustifolia,** Engelm.; S. Wats. in Proc. Am. Acad. xviii. p. 105.

North Mexico, Parras and Saltillo (*Palmer*, 588, 591).

[ii. p. 156.] 3. **Heliopsis parvifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 105.

North Mexico, in the mountains east of Saltillo (*Palmer*, 586).

[ii. p. 160.] 7. **Zaluzania triloba,** Pers.; S. Wats. in Proc. Am. Acad. xviii. p. 105.

North Mexico, Parras, Coahuila (*Palmer*, 592).

[ii. p. 164.] 2*. **Sclerocarpus kerberi,** Fournier in Bull. Soc. Bot. France, Comptes Rendus des Séances, xxx. (1883) p. 183.
South Mexico, Cordova (*Kerber*).

[ii. p. 166.] 19*. **Montanoa thomasii,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 8).
South Mexico, Orizaba (*Thomas*, 1866).

[ii. p. 172.] 2. **Zexmenia brevifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 105.
Texas.—North Mexico, Soledad, Coahuila (*Palmer*, 625).

[ii. p. 174.] 20. **Zexmenia scandens,** Hemsl.
The specific name was given to this in consequence of Bourgeau designating it a "liane;" but Dr. A. Gray sends a specimen of it to Kew collected by himself at Cordova, with the observation "frutex arborescens valde patens, nec scandens."

[ii. p. 174.] 23. **Zexmenia stenantha,** Hemsl.,=*Z. crocea*, A. Gr., fide Gray in Proc. Am. Acad. xix. p. 11.

ii. p. 176, nine lines from bottom, for *recurrens* read *decurrens*.

[ii. p. 177.] 2. **Viguiera canescens,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 105.
North Mexico, San Lorenzo de Laguna, Coahuila (*Palmer*, 618).

[ii. p. 178.] 5*. **Viguiera ghiesbreghtii,** A. Gr. in Proc. Am. Acad. xix. p. 6.
South Mexico, pine-forests in Morelia (*Ghiesbreght*, 381).

[ii. p. 178.] 7. **Viguiera helianthoides,** H. B. K. vide A. Gr. in Proc. Am. Acad. xix. p. 6.

[ii. p. 178.] 14. **Viguiera seemanni,** Schultz Bip.,=*Oyedæa seemanni*, A. Gr. in Proc. Am. Acad. xix. p. 10.

[ii. p. 179.] 1*. **Helianthus annuus,** Linn. Sp. Pl. ed. 2, p. 1276; DC. Prodr. v. p. 585; S. Wats. in Proc. Am. Acad. xviii. p. 105.
Helianthus lenticularis, Dougl. in Bot. Reg. t. 1265.
California to Nebraska and Texas.—North Mexico, without locality (*Palmer*, 600).

[ii. p. 179.] 2. **Helianthus cernuus,** Benth. et Hook., is a true *Flourensia*, vide A. Gr. in Proc. Am. Acad. xix. p. 7.

[ii. p. 179.] 3. **Helianthus ciliaris,** DC., var., S. Wats. in Proc. Am. Acad. xviii. p. 106.
North Mexico, Juraz, Coahuila (*Palmer*, 616).

[ii. p. 180.] 13*. **Helianthus tephrodes,** A. Gr. in Torr. Bot. U.S. and Mex. Bound. Surv. p. 90, et in Proc. Am. Acad. xx. p. 298.

Viguiera nivea, A. Gr. in S. Wats. Bot. Calif. i. p. 354, excl. syn.
Viguiera tephrodes, A. Gr. Synopt. Fl. N. Am. ii. p. 271.
Gymnolomia encelioides, A. Gr. in Proc. Am. Acad. xix. p. 4, et Synopt. Fl. N. Am. ii. p. 269.

California.—North Mexico, Sonora, sand hills near the Gulf of California (*Pringle*).

[ii. p. 184.] 8. **Encelia halimifolia,** Cav.; A. Gr. in Proc. Am. Acad. xix. p. 8.

North Mexico, Yaqui River, Sonora (*Palmer*).

[ii. p. 184.] 12. **Encelia mexicana,** Mart.

A. Gr. in Proc. Am. Acad. xix. p. 8, regards the following names as either certainly or probably synonyms:—*Coreopsis fœtida,* Cav., *Encelia fœtida,* Hemsl., *Simsia ficifolia,* Pers., *Simsia auriculata,* DC., *Simsia amplexicaulis,* Pers., *Encelia amplexicaulis,* Hemsl., *Helianthus amplexicaulis,* DC., *Simsia schaffneri,* Schultz Bip., *Simsia cordata,* Schz. Bip., *Ximenesia cordata,* H. B. K., and *Encelia cordata,* Hemsl.

[ii. p. 184.] 12. **Encelia mexicana,** Mart.; S. Wats. in Proc. Am. Acad. xviii. p. 106.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 493).

[ii. p. 185.] 15. **Encelia sericea,** Hemsl., is perhaps the same as *Encelia ghiesbreghtiana,* A. Gr.

[ii. p. 185.] 17. **Encelia subaristata,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 106.

Texas.—North Mexico, Caracol Mountains, Coahuila (*Palmer*, 615).

[ii. p. 185.] 1. **Helianthella mexicana,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 106.

North Mexico, Sierra Madre, south of Saltillo (*Palmer*, 601).

[ii. p. 185.] ACTINOMERIS. Dr. Gray reduces this to VERBESINA, vide Proc. Am. Acad. xix. p. 11.

[ii. p. 187.] 4*. **Verbesina coahuilensis,** A. Gr. in Proc. Am. Acad. xix. p. 14.

North Mexico, mountains six miles east of Saltillo, Coahuila (*Palmer*, 584, 619).

[ii. p. 187.]. 4**. **Verbesina coulteri,** A. Gr. in Proc. Am. Acad. xix. p. 13.

South Mexico, Zimapan (*Coulter*, 341, 369).

[ii. p. 189.] 17. **Verbesina ovatifolia,** A. Gr. ined. vide A. Gr. in Proc. Am. Acad. xix. p. 15.

[ii. p. 190.] 30*. **Verbesina virginica,** Linn., var. **palmeri,** A. Gr. in Proc. Am. Acad. xix. p. 11; S. Wats. in Proc. Am. Acad. xviii. p. 106.

North Mexico, Soledad, Coahuila (*Palmer*, 733).

This species ranges from Virginia and Illinois southward.

[ii. p. 190.] 30**. **Verbesina wrightii,** A. Gr. in Proc. Am. Acad. xix. p. 12; S. Wats. in Proc. Am. Acad. xviii. p. 106.

Arizona to Texas.—North Mexico, in the Sierra Madre, south of Saltillo, and at Parras, Coahuila (*Palmer*, 585, 597, 598).

This is under *Actinomeris* in this work, ii. p. 186.

[ii. p. 193.] 10. *Spilanthes sessilifolia*, Hemsl., is *Jægeria hirta*, Less.

[ii. p. 195.] 1. **Coreopsis anthemoides,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 15.

[ii. p. 196.] 9*. **Coreopsis schaffneri,** A. Gr. in Proc. Am. Acad. xix. p. 15.

North Mexico, region of San Luis Potosi (*Parry & Palmer*, 448; *Schaffner*, 202).

ii. p. 197, two lines from top, *for* 5183 *read* 5813.

[ii. p. 198.] 1. **Thelesperma gracile,** Torr. et A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

North Mexico, Saltillo and Parras, Coahuila (*Palmer*, 639).

ii. p. 199, six lines from bottom, for *Cosmos* read *Bidens*, and add *Cosmos* after Bot. Mag. t. 5227.

[ii. p. 202.] 18. **Bidens heterophylla,** Ort.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

North Mexico, Parras, Coahuila (*Palmer*, 634).

[ii. p. 202.] 20. **Bidens longifolia,** DC., = *B. heterophylla*, Ort. fide A. Gr. in Proc. Am. Acad. xix. p. 15.

[ii. p. 203.] 25. **Bidens procera,** Don; A. Gr. in Proc. Am. Acad. xix. p. 16. To this Dr. Gray would refer *B. fœniculifolia*, DC., and the specimens we have referred to *B. ferulæfolia*, DC.

[ii. p. 211.] 1. **Hymenopappus flavescens,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 650).

[ii. p. 211.] 1*. **Hymenopappus mexicanus,** A. Gr. in Proc. Am. Acad. xix. p. 29.

New Mexico; Arizona.—North Mexico, mountains near San Luis Potosi (*Schaffner*). Wright's specimen from Fronteras referred to *H. flavescens* belongs to this species.

[ii. p. 211.] 1. **Bahia absinthiifolia,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

North Mexico, Coahuila and Nuevo Leon (*Palmer*, 663, 672, 674)

Var. **dealbata,** A. Gr. in Proc. Am. Acad. xix. p. 27; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, near Monclova (*Palmer*).

[ii. p. 214.] 2. **Florestina tripteris,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

TEXAS.—NORTH MEXICO, Coahuila (*Palmer*, 654).

[ii. p. 214.] 1. **Palafoxia latifolia,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 31.

"Apparently unknown to recent botanists; but having 'opposite cordate leaves,' it can hardly be of this genus."—*A. Gray.*

There is a specimen in Kew Herbarium of Andrieux's 286, upon which De Candolle founded this species, and there is no doubt it belongs to the genus *Palafoxia* as limited by Bentham and Hooker, and to *Polypteris* as restored by Gray himself; therefore *Polypteris latifolia,* Hemsl. Indeed it is very near *P. lindeni,* A. Gr., which has the lower leaves strictly opposite, like *P. latifolia.*

[ii. p. 214.] 2. **Palafoxia lindeni,** A. Gr. in Proc. Am. Acad. xix. p. 30.

Dr. Gray restores the genus *Polypteris*, Nutt., to which he refers this plant.

[ii. p. 214.] 3. **Palafoxia linearis,** Lag.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 643).

This species should include *P. leucophylla,* A. Gr. in Proc. Am. Acad. vii. p. 291, fide A. Gr. in Proc. Am. Acad. xix. p. 31.

[ii. p. 214.] 4. **Palafoxia texana,** DC.

Polypteris texana, A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, Soledad, Coahuila (*Palmer*, 645).

[ii. p. 215.] 1*. **Sartwellia mexicana,** A. Gr. in Proc. Am. Acad. xix. p. 34; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, Monclova and San Lorenzo de Laguna, Coahuila (*Palmer*, 683, 687).

[ii. p. 216.] 1. **Flaveria angustifolia,** Pers.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 684).

[ii. p. 216.] 5. **Flaveria chloræfolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, Juraz and Parras, Coahuila (*Palmer*, 682, 2083).

[ii. p. 216.] 5. **Flaveria longifolia,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

Gymnosperma? oppositifolium, DC. Prodr. v. p. 312.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 681, 685).

[ii. p. 216.] 6. **Flaveria repanda,** Lag.; S. Wats. in Proc. Am. Acad. xviii. p. 107.

NORTH MEXICO, near Parras, Coahuila (*Palmer*, 686).

[ii. p. 216.] 3*. **Porophyllum ervendbergii,** A. Gr. in Proc. Am. Acad. xix. p. 35.

Porophyllum ellipticum, var., A. Gr. in Proc. Am. Acad. v. p. 184.

SOUTH MEXICO, Wartenberg, Tantoyuca (*Ervendberg*, 75).

[ii. p. 216.] 3**. **Porophyllum filifolium,** A. Gr. in Proc. Am. Acad. xix. p. 35; S. Wats. in op. cit. xviii. p. 107.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 688).

[ii. p. 216.] 3***. **Porophyllum gracile,** Benth. Bot. Voy. 'Sulphur,' p. 29; A. Gr. in Proc. Am. Acad. xix. p. 36.

LOWER CALIFORNIA.—MEXICO (*Coulter*, 449)?

[ii. p. 217.] 6. **Porophyllum linaria,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 36.

To this Dr. Gray refers the numbers enumerated under our *Porophyllum*, sp. 17.

[ii. p. 217.] 9. **Porophyllum macrocephalum,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, Soledad (*Palmer*, 704).

[ii. p. 217.] 12. **Porophyllum scoparium,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, at Parras, Saltillo, and Monterey (*Palmer*, 690 to 694).

[ii. p. 218.] 1. **Nicolletia edwardsii,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, Monclova, Coahuila (*Palmer*).

ii. p. 218, seventeen lines from bottom, for *Dyssodia* read *Dysodia*.

[ii. p. 219.] 1. **Dysodia appendiculata,** Lag.; A. Gr. in Proc. Am. Acad. xix. p. 38.

Aster americana, Houst. Reliq. t. 18.
Aster aurantius, Linn. Sp. Pl. ed. 1, p. 877.
Clomenocoma aurantia, Cass. Dict. ix. p. 416, et lix. p. 56; DC. Prodr. v. p. 641.
Clappia aurantiaca, Benth. in Hook. Ic. Pl. t. 1104?, fide A. Gr.

[ii. p. 219.] 3. **Dysodia grandiflora,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 38.

The synonyms quoted under this belong to a distinct species, *Dysodia montana*, A. Gr.

[ii. p. 219.] 3*. **Dysodia integrifolia,** A. Gr. in Proc. Am. Acad. xix. p. 37.

SOUTH MEXICO, district of Chiapas (*Ghiesbreght*, 784).

[ii. p. 219.] 4. **Dysodia pubescens,** Lag.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 579, 580).

[ii. p. 219.] 4*. **Dysodia squamosa,** A. Gr. in Proc. Am. Acad. xix. p. 38.

Dysodia appendiculata, Schultz Bip. in Seem. Bot. Voy. 'Herald,' p. 308, et huj. op. exl. synon. p. 219, non Lag. fide A. Gr.

NORTH MEXICO, Sierra Madre (*Seemann*, 1991), without locality (*Gregg*, 1061).

[ii. p. 219.] 4**. **Dysodia tagetiflora,** Lag. Gen. et Sp. Nov. p. 29; A. Gr. Pl. Wright. i. p. 114, et in Proc. Am. Acad. xix. p. 39.

Bœbera fastigiata, H. B. K. Nov. Gen. et Sp. iv. p. 198.

MEXICO.

We had wrongly referred this species and its synonyms to *D. chrysanthemoides.*

[ii. p. 220.] 7. **Hymenatherum næi,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 41.

Hymenatherum bœberoides, A. Gr., fide A. Gr. l. c.

Dr. Gray states that Parry and Palmer's 517 is this species, at least as to his specimens.

[ii. p. 220.] 8. **Hymenatherum pentachætum,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

Hymenatherum berlandieri, DC. fide S. Wats.

NORTH MEXICO, Coahuila and Nuevo Leon (*Palmer*).

[ii. p. 221.] 10*. **Hymenatherum tenuilobum,** DC. Prodr. v. p. 642; A. Gr. in Proc. Am. Acad. xix. p. 41.

Hymenatherum tenuifolium, A. Gr. Pl. Wright. i. p. 118, et huj. op. ii. p. 221, non Cass.

The Mexican plant is distinct from the Chilian.

[ii. p. 221.] 10**. **Hymenatherum thurberi,** A. Gr. in Proc. Am. Acad. xix. p. 41.

Hymenatherum tenuifolium, var.?, A. Gr. Pl. Wright. ii. p. 93.

TEXAS.—NORTH MEXICO (*Wright; Thurber; Parry*).

[ii. p. 222.] 4*. **Tagetes lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 40.

NORTH MEXICO, in the Huachuca Mountains (*Lemmon*).

[ii. p. 223.] 18*. **Tagetes subulata,** Llav. et Lex.; A. Gr. in Proc. Am. Acad. xix. p. 43.

To this Gray refers *T. multiseta*, DC., and *T. wislizeni*, A. Gr., and, less confidently, *T. oligocephala*; and *T. angustifolia*, H. B. K., he reduces to *T. coronopifolia*, while *T. clandestina*, Lag., he thinks is *T. fœtidissima* rather than *T. coronopifolia.*

[ii. p. 224.] 1. **Pectis angustifolia,** Torr.; S. Wats. in Proc. Am. Acad. xviii. p. 108; A. Gr. in Proc. Am. Acad. xix. p. 46.

NORTH MEXICO, at Saltillo and Monclova, Coahuila (*Palmer*, 701, 702), region of San Luis Potosi (*Schaffner*, 325; *Parry & Palmer*, 519).

[ii. p. 225.] 6. **Pectis canescens,** H. B. K.; A. Gr. Proc. Am. Acad. xix. p. 117.

Gray cites the following names as synonyms of this species:—*Lorentea canescens* and *L. satureioides*, Less. in Linnæa, v. p. 135, vi. p. 718; *L. auricularis*, *L. canescens*, and *L. satureioides*, DC. Prodr. v. p. 102; *Pectis auricularis*, *P. canescens*, and *P satureioides*, Schultz Bip. in Seem. Bot. Voy. 'Herald,' p. 225 (nomina tantum); *Pectis latisquama*, Schultz Bip. in Herb., A. Gr. in Proc. Am. Acad. v. p. 181, var. *berlandieri*, and *P. longipes*, huj. op. ii. p. 226, quoad pl. Berlandier, 3159.

[ii. p. 226.] 20. **Pectis prostrata,** Cav.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 640).

[ii. p. 226.] 23. **Pectis tenella,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 46.

NORTH MEXICO, Tamaulipas (*Berlandier; Gregg*).

[ii. p. 227.] 24. **Pectis uniaristata,** DC.; A. Gr. in Proc. Am. Acad. xix. p. 46.

NORTH MEXICO, Manzanilla (*Xantus*).

Var. **holostemma,** A. Gr. l. c.

Pectis filipes, Schultz Bip. in Hb. Liebm. non A. Gr.

SOUTH MEXICO, Consoquitla (*Liebmann*).

[ii. p. 227.] 7. **Helenium ooclinium,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 108.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 715).

[ii. p. 228.] **Gaillardia comosa,** A. Gr. in Proc. Am. Acad. xix. p. 34; S. Wats. in op. cit. xviii. p. 109.

NORTH MEXICO, at Saltillo (*Palmer*, 721).

[ii. p. 228.] **Gaillardia mexicana,** A. Gr. in Proc. Am. Acad. xix. p. 34; S. Wats. in op. cit. xviii. p. 109.

TEXAS.—NORTH MEXICO, in the Sierra Madre, south of Saltillo, and at Lerios, Coahuila (*Palmer*, 725, 726).

[ii. p. 228.] 1. **Gaillardia pinnatifida,** Torr.; S. Wats. in Proc. Am. Acad. xviii. p. 109.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 723).

[ii. p. 228.] 2*. **Gaillardia simplex,** Scheele in Linnæa, xxii. p. 160; S. Wats. in Proc. Am. Acad. xviii. p. 109.

Agassizia suavis, A. Gr. et Engelm. in Proc. Am. Acad. i. p. 50; A. Gr. Pl. Wright. i. p. 120.

TEXAS.—NORTH MEXICO, Saltillo and Monclova (*Palmer,* 727, 728).

[ii. p. 228.] **Actinella cooperi,** A. Gr. in Proc. Am. Acad. vii. p. 394, et xix. p. 33.

CALIFORNIA.—NORTH MEXICO, Tanner's Cañon, Huachuca (*Lemmon*).

[ii. p. 228.] **Actinella insignis,** A. Gr. in Proc. Am. Acad. xix. p. 31; S. Wats. in op. cit. xviii. p. 109.

NORTH MEXICO, Lerios, Coahuila (*Palmer,* 632).

[ii. p. 228.] **Actinella linearifolia,** Torr. et A. Gr. Fl. N. Am. ii. p. 382; A. Gr. Pl. Wright. i. p. 122; S. Wats. in Proc. Am. Acad. xviii. p. 109.

ARKANSAS; TEXAS.—NORTH MEXICO, Coahuila and Nuevo Leon (*Palmer,* 670, 671).

[ii. p. 228.] 1*. **Actinella (Plateilema) palmeri,** A. Gr. in Proc. Am. Acad. xix. p. 31; S. Wats. in op. cit. xviii. p. 109.

NORTH MEXICO, Saltillo (*Palmer,* 554).

[ii. p. 228.] 2. **Actinella scaposa,** Nutt.; S. Wats. in Proc. Am. Acad. xviii. p. 109.

NORTH MEXICO, Coahuila and Monterey, Nuevo Leon (*Palmer,* 657, 658, 659).

[ii. p. 231.] **Artemisia klotzschiana,** Bess. in Linnæa, xv. p. 107; A. Gr. in Proc. Am. Acad. xix. p. 48.

Artemisia, sp. (2), huj. op. ii. p. 231.

This species was founded upon an imperfect specimen collected by Schiede.

[ii. p. 231.] *Oligosporus mexicanus,* Less. Syn. Gen. Comp. p. 264,=**Artemisia mexicana,** Willd.

[ii. p. 231.] *Artemisia indica γ. mexicana,* Bess. Abrot. p. 56,=**Artemisia mexicana,** Willd.

[ii. p. 231.] 1. **Artemisia mexicana,** Willd.; S. Wats. in Proc. Am. Acad. xviii. p. 109.

NORTH MEXICO, Soledad, Coahuila (*Palmer,* 736).

[ii. p. 234.] 1. **Haploesthes greggii,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 109.

NORTH MEXICO, in the mountains east of Saltillo (*Palmer,* 649).

[ii. p. 235.] SENECIO.

Dr. Gray (Proc. Am. Acad. xix. p. 51), in a review of some of the North-American and Mexican species of *Senecio,* restores the genus *Cacalia.* If this be followed (and there is no doubt that *Cacalia* is as good a genus as many that are retained in the Helianthoideæ and Helenioideæ), a number of North-west Indian and South-African species must likewise be extracted from *Senecio* as left by Bentham.

[ii. p. 235.] 1. **Senecio acerifolius,** K. Koch, Wochenschrift, 1861, p. 237.
MEXICO.
This is apparently the same as **S. angulifolius,** DC.

[ii. p. 236.] 8*. *Senecio axillaris,* Klatt in Abhandl. naturf. Gesellsch. Halle, xv., =**S. salignus,** DC., fide S. Wats. in Proc. Am. Acad. xviii. p. 109.

[ii. p. 241.] 41*. **Senecio hellerii,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 13).
SOUTH MEXICO, Volcan de Toluca 14,000 feet (*Heller*, 355).

[ii. p. 242.] 44*. **Senecio huachucanus,** A. Gr. in Proc. Am. Acad. xix. p. 54.
NORTH MEXICO, mountains of Huachuca (*Lemmon*).

[ii. p. 242.] 50*. **Senecio madrensis,** A. Gr. in Proc. Am. Acad. xix. p. 55; S. Wats. in op. cit. xviii. p. 110.
NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 756).

[ii. p. 246.] 71*. **Senecio pullus,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 13).
SOUTH MEXICO, cordillera de Guichilaca (*Berlandier*, 1177).

[ii. p. 246.] 77. **Senecio sanguisorbæ,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 110.
NORTH MEXICO, Lerios, Coahuila (*Palmer*, 755).

[ii. p. 248.] 88*. **Senecio thomasii,** Klatt in Abhandl. naturf. Gesellsch. Halle, xv. (reprint, p. 12).
SOUTH MEXICO, Orizaba (*Thomas*, 1864).

ii. p. 251, thirteen lines from top, for *Cnicus conspicuus*, Hemsl., *read* Benth. in Benth. et Hook. Gen. Plant. ii. p. 469.

[ii. p. 255.] 2. *Perezia alamani*, Hemsl. (*Dumerilia alamani*, DC.),=*Perezia adnata,* A. Gr., fide A. Gr. in Proc. Am. Acad. xix. p. 61.
The specimens cited under *Perezia fruticosa* are of this species.

[ii. p. 255.] 2*. **Perezia carpholepis,** A. Gr. in Proc. Am. Acad. xix. p. 60.
Perezia patens, var. β et var. γ, A. Gr. Pl. Wright. i. p. 127.
SOUTH MEXICO, Chiapas (*Linden*, 439; *Galeotti*, 2001; *Liebmann*, 351; *Ghiesbreght*).

[ii. p. 256.] 3*. **Perezia dugesii,** A. Gr. in Proc. Am. Acad. xix. p. 60.
SOUTH MEXICO, Guanajuato (*Dugès*).

[ii. p. 256.] 3**. **Perezia formosa,** A. Gr. in Proc. Am. Acad. xix. p. 58.

All the synonyms, except *Acourtia turbinata*, DC., cited in this work, ii. p. 257, under *Perezia turbinata*, Llav. et Lex., belong here.

[ii. p. 256.] 6. **Perezia humboldtii,** A. Gr. in Proc. Am. Acad. xix. p. 59.

A factitious species made up of *Dumerilia humboldtii*, Less., which may be the same as *Perezia reticulata*, A. Gr., and *Proustia mexicana*, Don, which is probably *Perezia thurberi*, A. Gr.

[ii. p. 257.] 20. **Perezia turbinata,** Llav. et Lex.; A. Gr. in Proc. Am. Acad. xix. p. 58.

SOUTH MEXICO.

[ii. p. 257.] 20*. **Perezia wrightii,** A. Gr. Pl. Wright. i. p. 127, et in Proc. Am. Acad. xix. p. 60.

Perezia arizonica, A. Gr. in Wats. Bot. Calif. i. p. 422.
Perezia coulteri, pro parte, A. Gr. in Proc. Am. Acad. xv. p. 40.

ARIZONA to TEXAS.—NORTH MEXICO, region of San Luis Potosi (*Parry & Palmer*, 547, in part; *Schaffner*).

[ii. p. 259.] 3*. **Hieracium carneum,** Greene; A. Gr. in Proc. Am. Acad. xix. p. 69.

NEW MEXICO.—NORTH MEXICO, Huachuca Mountains (*Lemmon*).

[ii. p. 259.] 4. **Hieracium crepidispermum,** Fries; S. Wats. in Proc. Am. Acad. xviii. p. 110.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 758).

[ii. p. 260.] 6*. **Hieracium lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 70.

NORTH MEXICO, Cave Cañon, near Fort Huachuca (*Lemmon*).

[ii. p. 260.] 7. **Hieracium mexicanum,** Less., var. **niveopappum,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 110.

NORTH MEXICO, in the Sierra Madre, south of Saltillo (*Palmer*, 757), region of San Luis Potosi (*Parry & Palmer*, 552, 553).

[ii. p. 260.] 9*. **Hieracium pringlei,** A. Gr. in Proc. Am. Acad. xix. p. 69.

NORTH MEXICO, Santa Rita Mountains (*Pringle; Lemmon*).

[ii. p. 261.] 1. **Taraxacum officinale,** Wigg.; S. Wats. in Proc. Am. Acad. xviii. p. 110.

NORTH MEXICO, in the mountains east of Saltillo (*Palmer*, 761), San Luis Potosi (*Schaffner*).

CAMPANULACEÆ.

[ii. p. 263.] 1. **Burmeistera virescens,** add synon. *Centropogon virescens,* Planch. et Œrst. in Vidensk. Meddel. 1857, p. 157.

[ii. p. 264.] 2*. **Centropogon costaricanus,** Planch. et Œrst. in Vidensk. Meddel 1857, p. 156.
Costa Rica, Volcan de Irazu (*Œrsted*).

[ii. p. 264.] 5*. **Centropogon scandens,** Planch. et Œrst. in Vidensk. Meddel. 1857, p. 157.
Costa Rica, Jaris 3000 to 4000 feet (*Œrsted*).

[ii. p. 264.] 5**. **Centropogon nutans,** Planch. et Œrst. in Vidensk. Meddel. 1857, p. 156.
Costa Rica, Turrialva 3000 to 4000 feet (*Œrsted*).

[ii. p. 265.] 5*. **Siphocampylus gutierrezii,** Planch. et Œrst. in Vidensk. Meddel. 1857, p. 155.
Costa Rica, Volcan de Irazu 8000 to 9000 feet (*Œrsted*).

[ii. p. 267.] 12*. **Lobelia irasuensis,** Planch. et Œrst. in Vidensk. Meddel. 1857, p. 153.
Costa Rica, Volcan de Irazu at 8000 feet (*Œrsted*).

[ii. p. 267.] 13. **Lobelia laxiflora,** add synon. *Tupa laxiflora,* Planch. et Œrst. in Vidensk. Meddel. 1857, p. 153.

[ii. p. 269.] 24*. **Lobelia princeps,** Otto & Dietr. Allg. Gart. Zeit. vii. p. 298.
Mexico.
Said to be closely allied to *L. cardinalis* of the Southern States of N. America.

[ii. p. 269.] 25*. **Lobelia punicea,** Otto & Dietr. Allg. Gart. Zeit. vii. p. 299.
Mexico.
Probably only a variety of *L. fulgens.*

[ii. p. 270.] 3. **Heterotoma lobelioides,** Zucc.; S. Wats. in Proc. Am. Acad. xviii. p. 111.
North Mexico, mountains near Santa Maria del Rio, San Luis Potosi (*Schaffner,* 736).

VACCINIACEÆ.

[ii. p. 272.] 2. **Satryia warscewiczii,** Kl.
Guatemala (*Bernoulli & Cario,* 1954). Hb. Kew.

ERICACEÆ.

[ii. p. 283.] 2. **Chimaphila umbellata,** Nutt.

Guatemala (*Bernoulli & Cario*, 1964). Hb. Kew.

PLUMBAGINEÆ.

[ii. p. 287.] 1. **Plumbago pulchella,** Boiss.; S. Wats. in Proc. Am. Acad. xviii. p. 112.

North Mexico, region of San Luis Potosi (*Parry & Palmer*, 240).

Several other specimens enumerated by us under *P. scandens* also belong to this species, thus:—*Botteri*, 810; Guanajuato, *Hartweg*; and *Galeotti*, 1757, in part.

[ii. p. 287.] PRIMULACEÆ.

The now widely diffused *Anagallis arvensis*, Linn., was collected at Saltillo, by Palmer, and San Luis Potosi, by Schaffner; S. Wats. in Proc. Am. Acad. xviii. p. 112.

Gray now (Coulter's Bot. Gaz. 1886, p. 231), in a revision of *Dodecatheon*, defines five species.

ii. p. 299, fifteen lines from top, for *subsessiflora* read *subsessiliflora.*

SAPOTACEÆ.

[ii. p. 299.] 9. **Bumelia spinosa,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 112.

Arizona; Texas.—North Mexico, Saltillo, Coahuila (*Palmer*, 786).

EBENACEÆ.

[ii. p. 300.] 4. **Diospyros texana,** Scheele; S. Wats. in Proc. Am. Acad. xviii. p. 112.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 784).

OLEACEÆ.

[ii. p. 304.] 2. **Menodora helianthemoides,** Humb. et Bonpl.; S. Wats. in Proc. Am. Acad. xviii. p. 112.

Watson regards Parry & Palmer's 570 as a small-flowered form of this species rather than *M. coulteri*, A. Gr.

[ii. p. 304.] 4. **Menodora longiflora,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 112.

North Mexico, Monclova and Juraz, Coahuila (*Palmer*, 792, 794).

[ii. p. 304.] 6. **Menodora scabra,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 304.

North Mexico, at Juraz on the Sabinas river, Coahuila (*Palmer*, 793).

APOCYNACEÆ.

[ii. p. 307.] 1. **Rauwolfia heterophylla,** Rœm. et Schult.
Guatemala (*Bernoulli & Cario*, 1831). Hb. Kew.

[ii. p. 307.] 2. **Rauwolfia longifolia,** A. DC.
Guatemala (*Bernoulli & Cario*, 1809). Hb. Kew.

[ii. p. 313.] 2. **Apocynum cannabinum,** Linn.; S. Wats. in Proc. Am. Acad. xviii. p. 113.

Palmer's 806, referred by us to *A. androsæmifolium*, is this species, and the latter is not known to occur in Mexico.

[ii. p. 314.] 3*. **Echites (Euechites) coulteri,** S. Wats. in Proc. Am. Acad. xviii. p. 113.

North Mexico, south of Saltillo (*Palmer*, 805), without locality (*Coulter*, 987).

ASCLEPIADEÆ.

[ii. p. 322.] 2. *Acerates circinalis*, *A. asperula*, and *A. gomphocarpoides* are referred by Fournier (Ann. Sc. Nat. série 6, xiv. p. 369) to *Asclepiodora*. *Gomphocarpus arachnoideus*, Fourn. in Bull. Soc. Bot. France, xiv. p. 250, raised at Paris from Mexican seeds, we had overlooked, as well as *G. hypoleucus*, A. Gray, from the Santa Rita Mountains.

[ii. p. 322.] 4*. **Acerates viridiflora,** Ell.; Chapm. Fl. Southern U.S. p. 365; S. Wats. in Proc. Am. Acad. xviii. p. 114.

Eastern North America.—North Mexico, Caracol Mountains, Coahuila (*Palmer*).

[ii. p. 322.] 4**. **Acerates schaffneri,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 386.

Mexico, without locality (*Schaffner*, 861).

[ii. p. 322.] 4***. **Acerates vinosa,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 387.

South Mexico, among pines at an elevation of 9000 feet (*Ghiesbreght*, 35).

[ii. p. 322.] **Asclepias alticola,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 371.

South Mexico, in the cordillera between Cuernavaca and Toluca (*Ghiesbreght*).

[ii. p. 323.] 7. *Asclepias elata*, Benth.,=**A. glaucescens,** H. B. K., fide S. Wats. in Proc. Am. Acad. xviii. p. 114.

[*Asclepias galeottii*, Fourn. in Bull. Soc. Bot. France, xiv. p. 250 (*Blepharodon*, Galeotti), not taken up by the author in his review of the genus in the *Annales*.]

[ii. p. 323.] 11*. **Asclepias grandiflora,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 379.

MEXICO, without locality (*Hahn*).

[ii. p. 324.] 15*. **Asclepias lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 85.

NORTH MEXICO, near Fort Huachuca and on slopes in Tanner's Cañon (*Lemmon*).

[ii. p. 325.] 23*. **Asclepias otarioides,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 373.

SOUTH MEXICO, Conservera, Desierto (*Uhde*).

[ii. p. 325.] 24*. **Asclepias pellucida,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 381.

SOUTH MEXICO, San José del Oro (*Karwinski*), San Cristobal near Orizaba (*Botteri*, 317), without locality (*Berlandier*).

[ii. p. 325.] 24**. **Asclepias perennis,** Walk., var. **parvula,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 114.

The Mexican specimens referred by us to *A. nivea*, Linn., belong to this species.

[ii. p. 327.] 35*. **Asclepias virletii,** Fournier in Ann. Sc. Nat. série 6, xiv. p. 378.

NORTH MEXICO, San Luis Potosi (*Virlet*, 1685, 1692).

[ii. p. 327.] 1*. **Metastelma arizonicum,** A. Gr. in Proc. Am. Acad. xix. p. 85.

NORTH MEXICO, hills near Tucson (*Pringle*).

[ii. p. 327.] 2*. **Metastelma californicum,** Benth. Bot. Voy. 'Sulphur,' p. 33, t. 18; S. Wats. in Proc. Am. Acad. xviii. p. 115.

Bay of Magdalena, LOWER CALIFORNIA.—NORTH MEXICO, Caracol Mountains, Coahuila (*Palmer*, 828), near San Luis Potosi (*Schaffner*, 625).

[ii. p. 327.] 3*. **Metastelma palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 115 (*Metastelma cubense*, Dcne.?; huj. op. ii. p. 327).

NORTH MEXICO, at Laredo on the Rio Grande (*Palmer*, 824), about San Luis Potosi (*Schaffner*); SOUTH MEXICO, Chiapas (*Ghiesbreght*, 664), valley of Mexico (*Bourgeau*, 627).

[ii. p. 328.] 1*. **Vincetoxicum mexicanum,** S. Wats. in Proc. Am. Acad. xviii. p. 115.

NORTH MEXICO, Sierra Madre, south of Saltillo (*Palmer*, 823), region of San Luis Potosi (*Parry & Palmer*, 575; *Schaffner*, 652 in part); SOUTH MEXICO, Orizaba (*Botteri*, 342, 984).

Watson suggests that *Metastelma angustifolium*, Turcz., may be the same as this. It is very closely allied to *V. kunthii.*

[ii. p. 328.] 11*. ROTHROCKIA.

Rothrockia, A. Gr. in Proc. Am. Acad. xx. p. 295.

An herbaceous monotype.

1. **Rothrockia cordifolia,** A. Gr. in Proc. Am. Acad. xx. p. 295.
North Mexico, Sonora, rocky hills south-west of Altar (*Pringle*).

[ii. p. 329.] 1*. **Roulinia palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 115.
Roulinia unifaria, huj. op. ii. p. 328, non Engelm.
North Mexico, Monclova, Coahuila (*Palmer*, 829).

[ii. p. 331.] 6*. **Gonolobus diadematus,** Edwards, Bot. Reg. t. 252; DC. Prodr. viii. p. 593.
Mexico.

[ii. p. 335.] 16*. HIMANTOSTEMMA.

Himantostemma, A. Gr. in Proc. Am. Acad. xx. p. 294.

An herbaceous monotype.

1. **Himantostemma pringlei,** A. Gr. in Proc. Am. Acad. xx. p. 294.
North Mexico, Sonora, south of Altar, about thirty miles from the Gulf of California (*Pringle*).

LOGANIACEÆ.

[ii. p. 343.] 20*. **Buddleia pringlei,** A. Gr. in Proc. Am. Acad. xix. p. 86.
North Mexico, fields near Tucson (*Pringle*).

GENTIANACEÆ.

✓ [ii. p. 344.] 1. **Leianthus axillaris,** Hemsl.
Guatemala (*Bernoulli & Cario*, 1798). Hb. Kew.

[ii. p. 345.] 1. **Erythræa calycosa,** Buckl.; S. Wats. in Proc. Am. Acad. xviii. p. 117.
North Mexico, Parras, Coahuila (*Palmer*, 838), between Mapimi and Guajuguilla (*Gregg*).

[ii. p. 350.] 8. **Gentiana lanceolata,** Griseb.; S. Wats. in Proc. Am. Acad. xviii. p. 117.
South Mexico, Guanajuato (*Dugès*).

[ii. p. 353.] 12. **Halenia rothrockii,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 117.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 839).

POLEMONIACEÆ.

[ii. p. 354.] **Gilia aggregata,** D. Don in Edinb. Phil. Journ. 1822, vii. p. 288; Spreng. Syst. Veg. i. p. 626 (1825); Sweet, Brit. Fl. Gard. series 2, t. 218; A. Gr. Synop. Fl. N. Am. ii. p. 145; S. Wats. in Proc. Am. Acad. xviii. p. 117.

Ipomopsis elegans, Lindl. Bot. Reg. t. 1281.
Gilia pulchella, Dougl. in Hook. Fl. Bor.-Am. ii. p. 74.
Cantua aggregata, Pursh. Fl. Am. Sept. i. p. 147.

Oregon and Nebraska to California and Texas.—North Mexico, in the high mountains at Lerios, Coahuila (*Palmer*).

[ii. p. 356.] 5*. **Lœselia greggii,** S. Wats. in Proc. Am. Acad. xviii. p. 117.

North Mexico, Saltillo, Coahuila (*Palmer*, 1063), without locality (*Gregg*).

Watson (*loc. cit.*) suggests that *L. involucrata,* Don (huj. op. ii. p. 357), is the same as *L. ciliata,* Linn. (huj. op. ii. p. 356), of which we have seen no authenticated specimen.

HYDROPHYLLACEÆ.

[ii. p. 364.] 11. **Nama coulteri,** A. Gr. in Proc. Am. Acad. xviii. p. 118.

Palmer's 859, at first referred to *N. hispidum,* is this species.

[ii. p. 365.] 14. **Nama stenocarpum,** A. Gr.

The character at the end of the description of *N. stenophyllum* (huj. op. ii. p. 361), "*capsula inferne cum calyce longius adnata,*" belongs to *N. stenocarpum.* It was sent by Dr. Gray to be added to his original description and inadvertently put into the wrong place.

BORAGINEÆ.

[ii. p. 369.] 29. **Cordia podocephala,** Torr.; S. Wats. in Proc. Am. Acad. xviii. p. 119.

North Mexico, Soledad, Coahuila (*Palmer*, 1024).

[ii. p. 371.] 3*. **Coldenia (Eddya) mexicana,** S. Wats. in Proc. Am. Acad. xviii. p. 119.

North Mexico, mountains east of Saltillo, and at Monclova, Coahuila (*Palmer*, 872, 874 in part), region of San Luis Potosi (*Parry & Palmer*, 616½).

[ii. p. 371.] 3**. **Coldenia tomentosa,** S. Wats. in Proc. Am. Acad. xviii. p. 120.

North Mexico, in the Sierra Madre, south of Saltillo (*Palmer*, 864).

We had regarded this plant as a form of *C. canescens*, and we are still of opinion that both this and *C. mexicana* are at most varieties of that species.

[ii. p. 373.] 16*. **Tournefortia monclovana,** S. Wats. in Proc. Am. Acad. xviii. p. 120.

North Mexico, Monclova, Coahuila (*Palmer*, 887).

ii. p. 374, fifteen lines from the top, for *Helitropium* read *Heliotropium.*

[ii. p. 376.] 18*. **Heliotropium (Euheliotropium) palmeri,** A. Gr. ex S. Wats. in Proc. Am. Acad. xviii. p. 121.

North Mexico, Soledad, Coahuila (*Palmer*, 891, 892).

[ii. p. 377.] 2. **Omphalodes cardiophylla,** A. Gr. in Proc. Am. Acad. xx. p. 263.

[ii. p. 378.] Dr. Gray (Proc. Am. Acad. xx. p. 278, in nota) suggests that *Myosotis grandiflora*, H. B. K. (Nov. Gen. et Sp. iii. p. 90, t. 199; DC. Prodr. x. p. 114), is a species of *Krynitzkia*, and that the Quitian locality recorded is an error. Schiede and Deppe, according to De Candolle, collected it on Mount Orizaba. It was accidentally omitted from our enumeration, as well as *Myosotis albida*, H. B. K. (Nov. Gen. et Sp. iii. p. 91; DC. Prodr. x. p. 113). *Anchusa tuberosa*, H. B. K. (*l. c.* p. 92), is another doubtful Mexican *Boraginea.*

[ii. p. 379.] 2*. **Antiphytum parryi,** S. Wats. in Proc. Am. Acad. xviii. p. 122.

North Mexico?, between San Luis Potosi and San Antonio in Texas (*Parry & Palmer*, 618).

[ii. p. 379.] (14). KRYNITZKIA.

Krynitzkia, Fisch. et Mey. Ind. Sem. Hort. Petrop. vii. (1841) p. 52; A. Gr. in Proc. Am. Acad. xx. p. 264.

Gray amplifies this genus, including in it *Krynitzkia* and *Eritrichium* sect. v.–vii. DC. Prodr. x. pp. 128–134, and *Eritrichium* § *Krynitzkia*, § *Eueritrichium-Myosotidea*, and *Antiphytum*, A. Gr. in Proc. Am. Acad. x. p. 55, and Synopt. Fl. N. Am. ii. pp. 191–197 and 199.

Krynitzkia heliotropoides, A. Gr. in Proc. Am. Acad. xx. p. 265,=*Antiphytum heliotropoides*, A. DC.

Krynitzkia floribunda, A. Gr. loc. cit.,=*Antiphytum floribundum*, A. Gr.

Krynitzkia palmeri, A. Gr. in Proc. Am. Acad. xx. p. 278.

Eritrichium fulvocanescens, S. Wats. in Proc. Am. Acad. xviii. p. 121.
Eritrichium, sp.? (7), huj. op. ii. p. 378.

North Mexico, Sierra Madre, Coahuila (*Palmer*, 895). Hb. Kew.

[ii. p. 381.] 6. **Lithospermum matamorense,** DC.; S. Wats. in Proc. Am. Acad. xviii. p. 122.

Eritrichium, sp. n. 7, huj. op. ii. p. 378.

NORTH MEXICO, Guajuco and Monterey, Nuevo Leon (*Palmer*, 901, 902).

[ii. p. 381.] 6*. **Lithospermum palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 122.

NORTH MEXICO, in the Sierra Madre south of Saltillo, Coahuila (*Palmer*, 903).

CONVOLVULACEÆ.

[ii. p. 384.] 15*. **Ipomœa cardiophylla,** A. Gr. Synopt. Fl. N. Am. ii. p. 213; S. Wats. in Proc. Am. Acad. xviii. p. 122.

TEXAS.—NORTH MEXICO, at Soledad, twenty-five miles south of Monclova, Coahuila (*Palmer*, 904).

[ii. p. 386.] 21. **Ipomœa commutata,** Rœm. et Schult.; S. Wats. in Proc. Am. Acad. xviii. p. 122.

NORTH MEXICO, Soledad, twenty-five miles south of Monclova, Coahuila (*Palmer*, 907).

[ii. p. 386.] 23. **Ipomœa costellata,** Torr.; S. Wats. in Proc. Am. Acad. xviii. p. 123.

NORTH MEXICO, in the mountains north-east of Monclova, Coahuila (*Palmer*, 2095).

[ii. p. 386.] 23*. **Ipomœa cuneifolia,** A. Gr. in Proc. Am. Acad. xix. p. 90.

NORTH MEXICO, in Tanner's Cañon, near Fort Huachuca (*Lemmon*).

[ii. p. 388.] 37*. **Ipomœa lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 91.

NORTH MEXICO, in the mountains near Fort Huachuca (*Lemmon*).

[ii. p. 388.] 38. **Ipomœa heterophylla,** Ort.? S. Wats. in Proc Am. Acad xviii. p. 123.

NORTH MEXICO, near Morales, San Luis Potosi (*Schaffner*, 619), without locality (*Gregg*).

[ii. p. 390.] 59. **Ipomœa mexicana,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 122.

NORTH MEXICO, at Soledad, Coahuila (*Palmer*, 905).

[ii. p. 393.] 82*. **Ipomœa schaffneri,** S. Wats. in Proc. Am. Acad. xviii. p. 123.

NORTH MEXICO, about San Luis Potosi (*Schaffner*).

[ii. p. 395.] 96. **Ipomœa thurberi,** A. Gr. in Proc. Am. Acad. xix. p. 90.

NORTH MEXICO?

This is from Southern Arizona; but whether south of the Gila and within our limits does not appear.

[ii. p. 395.] 105. **Ipomœa versicolor,** Meissn.; S. Wats. in Proc. Am. Acad. xviii. p. 123.

North Mexico, San Luis Potosi (*Schaffner*).

[ii. p. 399.] 7. **Evolvulus discolor,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 123.

North Mexico, Saltillo, Coahuila (*Palmer*, 912).

[ii. p. 401.] 3. **Cuscuta arvensis,** Beyrich; Engelm. in A. Gr. Man. Bot. Northern U. S. ed. 2, p. 336; A. Gr. Synopt. Fl. N. Am. ii. p. 220; S. Wats. in Proc. Am. Acad. xviii. p. 124.

Oregon and Illinois southward.—North Mexico, Parras, Coahuila (*Palmer*, 919), San Luis Potosi (*Schaffner*).

[ii. p. 401.] 3*. **Cuscuta aurea,** Liebm. in Forhandl. Skand. Naturf. 4de Möde, 1844, p. 193; Bot. Zeit. 1844, p. 622; Flora, 1847, p. 144.

Mexico, Chapulco, Puebla 5500 feet (*Liebmann*).

[ii. p. 402.] 9*. **Cuscuta odontolepis,** Engelm. Cusc. p. 486; A. Gr. Synopt. Fl. N. Am. ii. p. 223; S. Wats. in Proc. Am. Acad. xviii. p. 125.

Arizona.—South Mexico, Guanajuato (*Dugès*).

[ii. p. 402.] 9**. **Cuscuta potosina,** Schaffner; S. Wats. in Proc. Am. Acad. xviii. p. 124.

North Mexico, near San Luis Potosi (*Schaffner*, 779).

[ii. p. 402.] 10*. **Cuscuta sidarum,** Liebm. in Forhandl. Skand. Naturf. 4de Möde, 1844, p. 193; Bot. Zeit. 1844, p. 622.

Mexico, Santiago Estata, Oaxaca (*Liebmann*).

[ii. p. 402.] 11*. **Cuscuta strobilacea,** Liebm. in Forhandl. Skand. Naturf. 4de Möde, 1844, p. 193; Bot. Zeit. 1844, p. 622.

Mexico, Mirador, Vera Cruz (*Liebmann*).

It is probable that the three preceding proposed species of *Cuscuta*, previously overlooked, are all represented under different names in our enumeration, and it may be that one or more of the above names belong to species more recently described by Engelmann.

SOLANACEÆ.

[ii. p. 416.] 133. **Solanum tuberosum,** Linn.; S. Wats. in Proc. Am. Acad. xviii. p. 125.

North Mexico, in the Sierra Madre south of Saltillo, Coahuila (*Palmer*, 937, 938), mountains near San Luis Potosi (*Parry & Palmer*, 632, 633; *Schaffner*, 693, 694).

Schaffner gives the popular name " Peyrilla del Monte."

[ii. p. 418.] 10*. **Physalis fendleri,** A. Gr. in Proc. Am. Acad. x. p. 65, et Synopt. Fl. N. Am. p. 236; S. Wats. in Proc. Am. Acad. xviii. p. 126.

COLORADO; NEW MEXICO.—NORTH MEXICO, mountains near San Luis Potosi (*Schaffner*, 698; *Parry & Palmer*, 642).

[ii. p. 420.] *Physalis edulis*, Sims, Bot. Mag. t. 1068, et *P. violacea*, Carrière in Rev. Hort. 1882, p. 216, cum ic. color.,=**P. peruviana** varietates.

[ii. p. 420.] 21*. **Physalis lobata,** Torr. in Ann. Lyc. N. York, i. p. 226; A. Gr. Synopt. Fl. N. Am. ii. p. 233; S. Wats. in Proc. Am. Acad. xviii. p. 126.

COLORADO; ARIZONA; TEXAS.—NORTH MEXICO, mountains west of Saltillo, Coahuila (*Palmer*, 943).

[ii. p. 420.] 28*. **Physalis philadelphica,** Lam. Dict. ii. p. 101; A. Gr. Synopt. Fl. N. Am. ii. p. 234; S. Wats. in Proc. Am. Acad. xviii. p. 126.

PENNSYLVANIA and ILLINOIS to TEXAS.—NORTH MEXICO, near Morales, San Luis Potosi (*Schaffner* 701, in part).

[ii. p. 422.] 6. **Saracha umbellata,** G. Don; S. Wats. in Proc. Am. Acad. xviii. p. 127.

Watson reduces *S. glabrata*, Miers, to this species; and also Bourgeau's 347, referred in this work to *S. jaltomata*.

[ii. p. 424.] 1*. **Margaranthus lemmoni,** A. Gr. in Proc. Am. Acad. xix. p. 92.

NORTH MEXICO, in Cave Cañon, near Fort Huachuca (*Lemmon*).

[ii. p. 425.] 13*. CACABUS.

Cacabus, Bernh. in Linnæa, xiii. p. 360; Benth. et Hook. Gen. Plant. ii. p. 896.

Annual or perennial herbs inhabiting Western Tropical and Subtropical America, chiefly in maritime districts.

[ii. p. 425.] 1. **Cacabus mexicanus,** S. Wats. in Proc. Am. Acad. xviii. p. 127.

NORTH MEXICO, in the San Miguelito mountains, San Luis Potosi (*Schaffner*, 704).

[ii. p. 426.] 3*. **Lycium exsertum,** A. Gr. in Proc. Am. Acad. xx. p. 305.

NORTH MEXICO, Sonora, near Altar (*Pringle*).

[ii. p. 426.] 3**. **Lycium macrodon,** A. Gr. in Proc. Am. Acad. vi. p. 46; S. Wats. Bot. Calif. i. p. 542; Proc. Am. Acad. xx. p. 306.

CALIFORNIA.—NORTH MEXICO, Sonora (*Pringle*).

[ii. p. 428.] 8. **Datura quercifolia,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 128.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 959), region of San Luis Potosi (*Schaffner*, 705, 706; *Parry & Palmer*, 658).

[ii. p. 432.] 24. **Cestrum multinervium,** Dun.; S. Wats. in Proc. Am. Acad. xviii. p. 128.

Texas.

[ii. p. 433.] 26. *Cestrum fœtidissimum,* Jacq. Hort. Schœnb. iii. t. 329, is specifically distinct from **C. nocturnum,** to which we, following Grisebach (Fl. Brit. W. Ind. p. 444), had referred it; and it is probably not found within our area.

[ii. p. 434.] 40*. **Cestrum warscewiczii,** Klotzsch in Otto & Dietr. Allg. Gart. Zeit. xix. p. 362.

Costa Rica, Cartago (*Warscewicz*).

Closely allied to *C. aurantiacum,* Lindl., and originally known in the gardens of Europe under the name of *Habrothamnus aureus.*

[ii. p. 435.] 4*. **Nicotiana nudicaulis,** S. Wats. in Proc. Am. Acad. xviii. p. 128.

North Mexico, Monterey, Nuevo Leon (*Palmer,* 961).

[ii. p. 435.] 12*. **Nicotiana trigonophylla,** Dun. in DC. Prodr. xi. p. 562; A. Gr. Synopt. Fl. N. Am. ii. p. 242; S. Wats. in Proc. Am. Acad. xviii. p. 128.

California to Texas.—North Mexico, in the mountains east of Saltillo, Coahuila (*Palmer,* 962), in rocky places about San Luis Potosi (*Schaffner,* 688; *Parry & Palmer,* 660).

ii. p. 438, top line, for *Brachylossis* read *Brachyglossis.*

SCROPHULARINEÆ.

[ii. p. 444.] 5. **Pentstemon campanulatus,** Willd.; S. Wats. in Proc. Am. Acad. xviii. p. 129.

North Mexico, at Lerios, in the high mountains east of Saltillo, Coahuila (*Palmer,* 976).

[ii. p. 445.] 15*. **Pentstemon rubescens,** A. Gr. in Proc. Am. Acad. xix. p. 92.

North Mexico, in Tanner's Cañon, near Fort Huachuca (*Lemmon*).

[ii. p. 449.] 2. **Mimulus glabratus,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 130.

North Mexico, at Saltillo and San Lorenzo de Laguna (*Palmer,* 977, 979).

[ii. p. 451.] 1. **Herpestis chamædryoides,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 130.

Watson states that the form we have referred to *H. nigrescens,* Benth., is really this species.

[ii. p. 456.] BUCHNERA.

In a revision (Proc. Am. Acad. xix. p. 93) of the North-American species of this genus, Dr. Gray restores *B. pilosa* to specific rank, and excludes as well *B. lithospermifolia*, H. B. K., from the synonymy of *B. elongata*. He also refers Hartweg's 100 and Botteri's 583 and 794 to our *B. mexicana*; and he doubtfully adds *B. disticha*, H. B. K., to the Mexican species (*Ghiesbreght*, 8260), with *B. tinctoria*, Bertol.?, for a synonym.

[ii. p. 456.] 32*. ALECTRA.

Alectra, Thunb. Nov. Gen. p. 81; Benth. et Hook. Gen. Plant. ii. p. 966.

About fourteen species, spread over Tropical Asia, Africa, and America.

1. **Alectra brasiliensis,** Benth. in DC. Prodr. x. p. 339; Griseb. Fl. Brit. W. Ind. p. 428.

GUATEMALA (*Bernoulli & Cario*, 2205).—WEST INDIES and COLOMBIA to BRAZIL. Hb. Kew.

[ii. p. 459.] 2*. **Gerardia (Dasystoma) greggii,** S. Wats. in Proc. Am. Acad. xviii. p. 131.

NORTH MEXICO, in the Sierra Madre south of Saltillo, Coahuila (*Palmer*, 2024), without locality (*Gregg*).

We had wrongly referred Palmer's specimens to *G. grandiflora*, Benth., which species is not known to occur in Mexico.

[ii. p. 463.] 1. **Orthocarpus mexicanus,** Hemsl.; S. Wats. in Proc. Am. Acad. xviii. p. 133.

NORTH MEXICO, at Lerios, Coahuila (*Palmer*).

OROBANCHACEÆ.

[ii. p. 468.] **Aphyllon (Nothaphyllon) dugesii,** S. Wats. in Proc. Am. Acad. xviii. p. 132.

SOUTH MEXICO, Guanajuato (*Dugès*).

[ii. p. 468.] CONOPHOLIS.

Until it was too late we had overlooked the publication by Liebmann of two new species of this genus; and since the appearance of that part of our work containing *Conopholis*, S. Watson, on the authority of an herbarium specimen named *C. mexicana* by A. Gray, has published a new species for some at least of the Mexican specimens in the Harvard herbarium. We must leave unanswered the question of the number of species of *Conopholis* in Mexico; but as Liebmann's descriptions were published in a book that has been entirely overlooked in this country and America, and is very rare, it will be useful to repeat them here.

[ii. p. 468.] **Conopholis alpina,** Liebm. in Forhandl. Skand. Naturf. 4de Möde, p. 184.

"Calyce unibracteolato, ventricoso-tubuloso, spathaceo, antice usque ad basin fisso, postice acuto, margine integro. Corollæ tubo cylindrico curvato, labio superiore reflexo fornicato integro inferius æquante; labio inferiore 3-lobo, lobis rectis lanceolatis. Staminibus 4 exsertis subæqualibus stylo æquantibus vel parum brevioribus. Stigmate discoideo medio impresso.

"Planta 6–8-pollicaris. Caulis simplicissimus carnosus crassus fusco-brunneus, basin versus incrassatus ibique squamis densissime imbricatis tectus, supra squamis majoribus sparsis obtectus; spica 3–4-pollicaris, floribus sessilibus fusco-flavescentibus.

"Habitat in alpe trachytio Tepeyecuapa prope oppidum Chinantla, Puebla, alt. 7000–8000 ped., ad radices Pinorum. Floret Aprili.

"Differt a *Conoph. americana*, Wallr., calyce unibracteolato, ad basin fisso, postice non inciso; corolla calyce duplo longiore, labio superiore reflexo integro lobos labii inferioris non superante; labii inferioris lobis brevioribus lanceolatis integris; staminibus longius exsertis; stylo longitudinem staminum parum excedente angulato porrecto (non reclinato); capsula apiculata (nec curvato-longirostrata), bractea breviore integra (nec bifida) instructa."

This probably corresponds to *C. mexicana*, A. Gr., as limited by Watson; but the differential characters given are not obvious.

[ii. p. 468.] 1*. **Conopholis mexicana,** A. Gr. in Herb. ex S. Wats. in Proc. Am. Acad. xviii. p. 131.

"Distinguished from *C. americana* by its longer and more rigid lanceolate acuminate scales, the calyx less deeply toothed, and the corolla larger (8 lines long).

"The plant figured by Endlicher (Iconogr. t. 81) for *C. americana* is *C. mexicana*, probably from Andrieux's collection."

As Watson observes, possibly from a memorandum by A. Gray, Endlicher's figure was most likely made from Andrieux's collection, for there is a specimen in the Kew Herbarium (formerly in Gay's herbarium) collected by Andrieux, which is so like the figure that it may have been the one actually drawn.

[ii. p. 468.] 1**. **Conopholis sylvatica,** Liebm. in Forhandl. Skand. Naturf. 4de Möde, p. 185.

"Calyce bibracteolato, ventricoso-tubuloso, spathaceo, antice ad medium fisso, postice bidentato. Corollæ tubo curvato basi ventricoso, labio superiore fornicato integro inferius superante, labio inferiore 3-lobo, lobis brevibus rectis obtusis. Staminibus 4-exsertis, subæqualibus stylum æquantibus. Stigmate capitato parum bisulco.

"Planta 7–9-pollicaris gracilescens. Caulis simplicissimus carnosus flaccido-fucescens, usque ad basin cylindricus, squamis imbricatis cartilaginosis lanceolatis flaccidis obtectus. Spica 5–7-pollicaris, floribus brevissime pedicellatis flavescentibus.

"Habitat in sylvis umbrosis ad radices Quercuum prope oppidum Totutla et prædium Hacienda de Mirador Dep. Vera Cruz, alt. 3000–4500 ped. Floret Febr.–Martio.

"Differt a *Conoph. americana*, Wallr., gracilitate caulis; calyce minore antice ad medium fisso, postice bidentato (nec 4-dentato); corolla graciliore calyce duplo longiore,

lobis labii inferioris brevioribus obtusioribus. Staminibus longius exsertis; stylo longitudinem staminum subæquante parum curvato."

The specimens in Kew Herbarium from Jalapa (*Linden*, 198) and Vera Cruz to Orizaba (*Müller*, 647) answer well to the foregoing description as to slenderness, and in being cylindrical to the base.

LENTIBULARIACEÆ.

[ii. p. 469.] 4. **Utricularia endresii,** Reichb. f. Bot. Mag. t. 6656.

[ii. p. 471.] 2*. **Pinguicula sodalium,** Fourn. in Bull. Soc. Bot. France, xx. p. lxvii.

South Mexico, Orizaba (*Müller*, 114).

This probably is the same as *P. caudata.*

GESNERACEÆ.

[ii. p. 473.] 3*. **Achimenes cardinalis,** A. Dietr. in Otto & Dietr. Allg. Gart. Zeit. xv. p. 314.

Mexico.

[ii. p. 480.] 1*. **Gesnera rugata,** Scheidw. in Otto & Dietr. Allg. Gart. Zeit. xv. p. 226.

Mexico (*Ghiesbreght*).

ii. p. 480, eight lines from top, for *tubiflora* read *tubiflorum.*

BIGNONIACEÆ.

[ii. p. 491.] 15*. **Bignonia peltata,** Otto & Dietr. Allg. Gart. Zeit. ix. p. 58.

Mexico.

ACANTHACEÆ.

[ii. p. 500.] *Elytraria bromoides*, Œrst.; S. Wats. in Proc. Am. Acad. xviii. p. 133.

Watson identifies Palmer's 2029 (Guajuco, Nuevo Leon) with this, which he says is quite distinct from *E. tridentata*, Vahl, to which we had referred it.

[ii. p. 503.] 6. **Calophanes jasminum-mexicanum,** Nees; S. Wats. in Proc. Am. Acad. xviii. p. 133.

Watson suggests that *C. decumbens*, A. Gr., and *C. schiedeana*, Nees, are the same as this.

[ii. p. 513.] 19*. PRINGLEOPHYTUM.

Pringleophytum, A. Gr. in Proc. Am. Acad. xx. p. 292.

A Mexican monotype.

1. **Pringleophytum lanceolatum,** A. Gr. in Proc. Am. Acad. xx. p. 293.

North Mexico, Sonora, on rocks fifty miles from Altar, and thirty miles from the Gulf of California (*Pringle*).

[ii. p. 525.] 6*. **Dicliptera pseudoverticillaris,** A. Gr. in Proc. Am. Acad. xx. p. 308.

North Mexico, Sonora, in the valley of the Altar (*Pringle*).

VERBENACEÆ.

[ii. p. 533.] 1*. **Verbena arizonica,** A. Gr. in Proc. Am. Acad. xix. p. 95.

North Mexico, in cañons near Fort Huachuca (*Lemmon*).

[ii. p. 535.] 18*. **Verbena wrightii,** A. Gr. Synopt. Fl. N. Am. ii. p. 337; S. Wats. in Proc. Am. Acad. xviii. p. 136.

New Mexico; Texas.—North Mexico, Chihuahua (*Wright*, 1504), at Lerios, in the high mountains east of Saltillo, Coahuila (*Palmer*, 1052), near Morales, San Luis Potosi (*Schaffner*); South Mexico, Guanajuato (*Dugès*).

[ii. p. 535.] 19. **Verbena xutha,** Lehm.; S. Wats. in Proc. Am. Acad. xviii. p. 136.

North Mexico, in the Sierra Madre south of Saltillo (*Palmer*, 1047).

LABIATÆ.

[ii. p. 546.] 3*. **Cunila secunda,** S. Wats. in Proc. Am. Acad. xviii. p. 136.

South Mexico, Guanajuato (*Dugès*).

[ii. p. 552.] 3*. **Salvia albo-cærulea,** Linden; Regel, Gartenfl. 1858, pp. 55 et 97, t. 221.

South Mexico, Michoacan (*Ghiesbreght*).

[ii. p. 556.] 41. **Salvia glechomæfolia,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 137.

North Mexico, at Lerios, in the high mountains east of Saltillo (*Palmer*, 1097), in the Sierra Madre south of the same place (*Palmer*, 1098).

Watson also refers several other specimens to this species, including Parry and Palmer's 761, which is certainly *S. prunelloides*, H. B. K., as to the Kew specimens.

[ii. p. 557.] 46. **Salvia greggii,** A. Gr.; S. Wats. in Proc. Am. Acad. xviii. p. 137; Bot. Mag. t. 6812.

NORTH MEXICO, at Lerios, in the high mountains east of Saltillo, Coahuila (*Palmer*, 1071).

[ii. p. 559.] 65*. **Salvia lemmoni,** A. Gr. in Proc. Am. Acad. xx. p. 309.

NORTH MEXICO, Huachuca Mountains, Southern Arizona (*Lemmon*; *Pringle*).

[ii. p. 560.] 73. *Salvia littæ*, Vis.=*S. tubifera*, Cav., fide Vatke in litt.

[ii. p. 564.] 113*. **Salvia roezlii,** Scheidw. in Flore des Serres, xiv. 1861, p. 31, t. 1407.

MEXICO (*Roezl*).

[ii. p. 566.] 126*. **Salvia tricolor,** Lemaire in Ill. Hort. 1856, t. 120; Flore des Serres, xii. 1857, p. 109, t. 1237.

MEXICO (*Fonel*).

[ii. p. 568.] 1*. **Cedronella breviflora,** A. Gr. in Proc. Am. Acad. xx. p. 309.

NORTH MEXICO, Santa Rita Mountains, Southern Arizona (*Pringle*).

[ii. p. 569.] 4. **Scutellaria drummondii,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 140.

NORTH MEXICO, in the Sierra Madre south of Saltillo, Coahuila (*Palmer*, 1085).

[ii. p. 569.] 10*. **Scutellaria rumicifolia,** H. B. K. Nov. Gen. et Spec. ii. p. 324; Benth. in DC. Prodr. xii. p. 426.

SOUTH MEXICO, Hacienda de la Laguna (*Schiede & Deppe*); GUATEMALA (*Bernoulli & Cario*).—COLOMBIA to CHILI and BUENOS AYRES. Hb. Kew.

[ii. p. 571.] 1*. **Stachys bigelovii,** A. Gr. in Proc. Am. Acad. viii. p. 371, et Synopt. Fl. N. Am. ii. p. 388; S. Wats. in Proc. Am. Acad. xviii. p. 140.

TEXAS.—NORTH MEXICO, San Luis Potosi (*Schaffner*, 685).

[ii. p. 572.] 4. **Stachys drummondii,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 140.

NORTH MEXICO, in the Caracol Mountains, south-east of Monclova, Coahuila (*Palmer*, 1094).

Parry and Palmer's 735, referred by us to *S. agraria*, also belongs here.

[ii. p. 573.] 16. *Stachys schiedeana*, Schl.,=**Lepechinia procumbens,** Benth. fide Vatke in litt.

PLANTAGINEÆ.

[ii. p. 575.] 2. **Plantago bernoulliana,** Vatke.

This was published in the Verhandl. Bot. Verein Brandenb. 1874, p. 48, not in the Œsterreich. Zeitschr.

[ii. p. 575.] 2*. **Plantago caulescens,** S. Wats. in Proc. Am. Acad. xviii. p. 141.

North Mexico, in the San Rafael Mountains, San Luis Potosi (*Schaffner*, 658).

NYCTAGINEÆ.

[iii. p. 3.] 3. **Oxybaphus cervantesii,** Sweet; S. Wats. in Proc. Am. Acad. xviii. p. 142.

Watson refers Palmer's 1111, referred by us to *O. viscosus*, to this species.

[iii. p. 4.] 6*. **Boerhaavia palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 142.

North Mexico, at Saltillo (*Palmer*, 1120).

ILLECEBRACEÆ.

[iii. p. 11.] 1*. **Corrigiola littoralis,** Linn.; Rohrb. in Linnæa, xxxvii. p. 199.

Rohrbach identifies specimens collected by Liebmann and Schaffner with this species; but all that we have seen certainly belong to *C. andina*.

AMARANTACEÆ.

[iii. p. 12.] 1*. **Celosia palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 143.

North Mexico, Soledad, Coahuila (*Palmer*, 1148), between San Luis Potosi and Tampico (*Palmer*, 1144).

Doubtingly referred by us to the South-American *C. virgatus*.

[iii. p. 14.] 9*. **Amarantus wrightii,** S. Wats. in Proc. Am. Acad. xviii. p. 144.

North Mexico, region of San Luis Potosi (*Parry & Palmer*, 786½).

The plant we had under this number we regarded as *Amarantus blitum*, Linn.

[iii. p. 17.] 1. **Gossypianthus rigidiflorus,** Hook.; S. Wats. in Proc. Am. Acad. xviii. p. 144.

North Mexico, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 788).

[iii. p. 20.] 2*. **Hebanthe palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 144.

North Mexico, Guajuco, Nuevo Leon (*Palmer*, 1138).

This is the *Hebanthe*, sp. (4) of this work, iii. p. 20, where the number is wrongly cited as 1133.

[iii. p. 21.] 3. **Iresine cassiniæformis,** Schauer in Linnæa, xix. p. 109?; S. Wats. in Proc. Am. Acad. xviii. p. 145.

North Mexico, Monterey, Nuevo Leon (*Palmer*, 1133).

CHENOPODIACEÆ.

[iii. p. 23.] 3. **Chenopodium berlandieri,** Moq.; S. Wats. in Proc. Am. Acad. xviii. p. 146.

North Mexico, Parras, Coahuila (*Palmer*, 1151), region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 780 in part).

[iii. p. 23.] 8. **Chenopodium fremontii,** S. Wats. in Proc. Am. Acad. xviii. p. 146.

North Mexico, San Luis Potosi (*Schaffner*, 851).

[iii. p. 24.] 10*. **Chenopodium stellatum,** S. Wats. in Proc. Am. Acad. xviii. p. 146.

North Mexico, Monclova, Coahuila (*Palmer*, 146).

[iii. p. 27.] 3. **Suæda torreyana,** S. Wats. in Proc. Am. Acad. xviii. p. 147.

North Mexico, Cienega Grande (*Gregg*), Parras, Coahuila (*Palmer*, 1168).

PHYTOLACCACEÆ.

[iii. p. 29.] 4*. PHAULOTHAMNUS.

Phaulothamnus, A. Gr. in Proc. Am. Acad. xx. p. 293.

A Mexican shrubby monotype.

1. **Phaulothamnus spinescens,** A. Gr. in Proc. Am. Acad. xx. p. 294.

North Mexico, Sonora, about thirty miles south of the United States boundary, and on the Rio Altar (*Pringle*).

[iii. p. 29.] 1*. *Phytolacca mexicana,* Gærtn.; S. Wats. in Proc. Am. Acad. xviii. p. 147.

Watson states that this is a species distinct from *P. icosandra*, Linn., to which we had referred it.

[iii. p. 30.] 1. **Agdestis clematidea,** Moç. et Sessé.

Guatemala (*Bernoulli & Cario*, 3399). Hb. Kew.

POLYGONACEÆ.

[iii. p. 32.] 11. **Eriogonum jamesii,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 147.

North Mexico, at Lerios, in the high mountains east of Saltillo (*Palmer*, 1172).

[iii. p. 34.] 10. **Polygonum pennsylvanicum,** Linn.; S. Wats. in Proc. Am. Acad. xviii. p. 147.

North Mexico, near Morales, San Luis Potosi (*Schaffner*, 882).

[iii. p. 35.] 1. **Rumex berlandieri,** Meissn.; S. Wats. in Proc. Am. Acad. xviii. p. 148.

NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 1182).

[iii. p. 35.] 4. **Rumex crispus,** Linn.; S. Wats. in Proc. Am. Acad. xviii. p. 147.

NORTH MEXICO, Parras, Coahuila (*Palmer*, 1181), near Morales, and at San Luis Potosi (*Schaffner*, 903, 907).

[iii. p. 35.] 6. **Rumex mexicanus,** Meissn.; S. Wats. in Proc. Am. Acad. xviii. p. 149.

NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 904, 906; *Parry & Palmer*, 794).

[iii. p. 38.] Bentham and Hooker, Gen. Plant. iii. p. 104, refer *Velasquezia melanodendron*, Bert. Fl. Guat. p. 39, t. 11, to *Triplaris*, a fact we had previously overlooked.

ARISTOLOCHIACEÆ.

[iii. p. 43.] 20. **Aristolochia pardina,** Duchartre; S. Wats. in Proc. Am. Acad. xviii. p. 148.

SOUTH MEXICO, Colima, where it is known as "Huaco" (*Dugès*).

This is perhaps the *Guaco mexicana*, Liebm. in Forhandl. Skand. Naturf. Kiöbenh. 1847, p. 203.

[iii. p. 43.] 22*. **Aristolochia (Eionomeia) subclausa,** S. Wats. in Proc. Am. Acad. xx. p. 372.

SOUTH MEXICO, Guanajuato (*Dugès*).

PIPERACEÆ.

[iii. p. 59.] 9. **Peperomia bourgeaui,** C. DC. in Mém. Soc. Phys. et Hist. Nat. Genève, xxvii. 2^e^ partie, p. 311, t. 6.

iii. p. 59, six lines from top, *for* DC. Prodr. xvi. 1, *read* Linnæa, xxxvii.

[iii. p. 63.] 65. **Peperomia petiolaris,** C. DC. in Mém. Soc. Phys. et Hist. Nat. Genève, xxvii. 2^e^ partie, p. 312, t. 8.

[iii. p. 64.] 66. **Peperomia petrophila,** C. DC. in Mém. Soc. Phys. et Hist. Nat. Genève, xxvii. 2^e^ partie, p. 315, t. 13.

LORANTHACEÆ.

[iii. p. 81.] 18*. **Loranthus (Psittacanthus) kerberi,** Fournier in Bull. Soc. Bot. France, Comptes Rendus des Séances, xxx. (1883), p. 185.

SOUTH MEXICO, near Cordova (*Kerber*).

EUPHORBIACEÆ.

[iii. p. 90.] **Euphorbia acuta,** Engelm.; DC. Prodr. xv. 2, p. 18; S. Wats. in Proc. Am. Acad. xviii. p. 150.

TEXAS.—NORTH MEXICO, Juraz, Coahuila (*Palmer*).

[iii. p. 91.] 7. **Euphorbia ammatotricha,** Boiss.?; S. Wats. in Proc. Am. Acad. xviii. p. 151.

NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 854 and 856, in part; *Parry & Palmer*, 813).

[iii. p. 91.] 14*. **Euphorbia (Zygophyllidium) biformis,** S. Wats. in Proc. Am. Acad. xviii. p. 151.

NORTH MEXICO, in the San Miguelito Mountains, San Luis Potosi (*Schaffner*, 860, 862), region of San Luis Potosi (*Parry & Palmer*, 806).

[iii. p. 93.] 25. **Euphorbia cumbræ,** Boiss.; S. Wats. in Proc. Am. Acad. xviii. p. 149.

NORTH MEXICO, in the mountains north of Monclova, Coahuila (*Palmer*, 1213).

[iii. p. 93.] 30*. **Euphorbia (Poinsettia) exclusa,** S. Wats. in Proc. Am. Acad. xviii. p. 150.

NORTH MEXICO, at San Lorenzo de Laguna, Coahuila (*Palmer*, 1218).

[iii. p. 98.] 73. **Euphorbia polycarpa,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 149.

NORTH MEXICO, Monterey, Nuevo Leon, and Juraz and San Lorenzo de Laguna, Coahuila (*Palmer*, 1197, 1204, 1205).

[iii. p. 99.] 78. **Euphorbia radians,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 151.

NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 857; *Parry & Palmer*, 822).

[iii. p. 100.] 88*. **Euphorbia serpyllifolia,** Pers.; DC. Prodr. xv. 2, p. 43; S. Wats. in Proc. Am. Acad. xviii. p. 151.

CANADA southward.—NORTH MEXICO, San Luis Potosi (*Schaffner*, 854 and 1034 in part; *Parry & Palmer*, 810 in part and 811).

[iii. p. 100.] 88**. **Euphorbia serrula,** Engelm.; DC. Prodr. xv. 2, p. 33; S. Wats. in Proc. Am. Acad. xviii. p. 149.

NEW MEXICO; TEXAS.—NORTH MEXICO, San Lorenzo de Laguna, Coahuila (*Palmer*, 1194), region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 810 in part).

[iii. p. 101.] 91*. **Euphorbia (Cyttarospermum) tenera,** S. Wats. in Proc. Am. Acad. xviii. p. 150.

NORTH MEXICO, in the Sierra Madre south of Saltillo (*Palmer*, 2053).

[iii. p. 102.] 100. **Euphorbia villifera,** Scheele; S. Wats. in Proc. Am. Acad. xviii. p. 149.

NORTH MEXICO, in the Caracol Mountains and in the Sierra Madre south of Saltillo (*Palmer*, 1199).

[iii. p. 104.] 18. **Phyllanthus polygonoides,** Spreng.; S. Wats. in Proc. Am. Acad. xviii. p. 151.

NORTH MEXICO, in the Caracol Mountains, at Monclova, Coahuila, and at Monterey, Nuevo Leon (*Palmer*, 1228, 1229).

[iii. p. 110.] 9*. **Croton corymbulosus,** Engelm. ex S. Wats. in Proc. Am. Acad. xviii. p. 152.

TEXAS; NEW MEXICO.—NORTH MEXICO, Soledad, twenty-five miles south-west of Monclova (*Palmer*, 1245).

Watson (*loc. cit.*) states that *Croton lindheimerianus*, Müll. Arg. in DC. Prodr. xv. 2, p. 579 (non Scheele), is the same as this.

[iii. p. 115.] 37. **Croton morifolius,** Willd., γ. **sphærocarpus,** Müll. Arg.; S. Wats. in Proc. Am. Acad. xviii. p. 152.

NORTH MEXICO, region of San Luis Potosi 6000 to 8000 feet (*Parry & Palmer*, 829).

[iii. p. 115.] 40*. **Croton palmeri,** S. Wats. in Proc. Am. Acad. xviii. p. 152.

NORTH MEXICO, Soledad, Coahuila (*Palmer*, 1239).

[iii. p. 116.] 43*. **Croton pringlei,** S. Wats. in Proc. Am. Acad. xx. p. 373.

NORTH MEXICO, north-western Sonora, about thirty miles from the coast (*Pringle*).

[iii. p. 117.] 57*. **Croton torreyanus,** Müll. Arg. in DC. Prodr. xv. 2, p. 579; S. Wats. in Proc. Am. Acad. xviii. p. 152.

NEW MEXICO.—SOUTH MEXICO, Monclova, Coahuila (*Palmer*, 1236).

[iii. p. 121.] **Bernardia (?) fasciculata,** S. Wats. in Proc. Am. Acad. xviii. p. 153.

NORTH MEXICO, Monclova, Coahuila (*Palmer*, 1233), Saucillo, Chihuahua (*Thurber*, 837), plains west of San Pablo (*Gregg*).

[iii. p. 122.] 2. **Acalypha anemioides,** H. B. K.; S. Wats. in Proc. Am. Acad. xviii. p. 154.

NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 31; *Parry & Palmer*, 825).

[iii. p. 125.] 27. **Acalypha lindheimeri,** Müll. Arg.; S. Wats. in Proc. Am. Acad. xviii. p. 154.

NORTH MEXICO, Monclova, Coahuila (*Parry & Palmer*, 826).

We had referred the Kew specimens of Parry and Palmer's 826 to *A. phleoides*.

[iii. p. 126.] 36*. **Acalypha neomexicana,** Müll. Arg. in DC. Prodr. xv. 2, p. 874; S. Wats. in Proc. Am. Acad. xviii. p. 154.

NEW MEXICO.—NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 32; *Parry & Palmer*, 737).

[iii. p. 135.] 5*. **Stillingia torreyana,** S. Wats. in Proc. Am. Acad. xviii. p. 154.

NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 1258).

"It is nearly certain that *Sebastiania treculiana*, Müll. Arg., is not distinct" (*Watson*).

[iii. p. 136.] 2. **Sebastiania (?) bilocularis,** S. Wats. in Proc. Am. Acad. xx. p. 374.

NORTH MEXICO, Sonora (*Thurber*).

URTICACEÆ.

[iii. p. 139.] 4. **Celtis berlandieri,** Klotzsch; DC. Prodr. xvii. p. 178; S. Wats. in Proc. Am. Acad. xviii. p. 155.

TEXAS.—NORTH MEXICO, Monterey, Nuevo Leon (*Palmer*, 1261).

PLATANACEÆ.

[iii. p. 162.] 1. **Platanus lindeniana,** Mart. et Gal.; S. Wats. in Proc. Am. Acad. xviii. p. 155.

The specimens collected by Palmer (1269), doubtingly referred by us to *P. racemosa*, belong to this species, according to Watson; but the differences noted between this and *P. mexicana* are hardly specific.

CUPULIFERÆ.

[iii. p. 166.] 2*. CARPINUS.

Carpinus, Linn. Gen. Plant. n. 1073, pro parte; Benth. et Hook. Gen. Plant. iii. p. 405.

Nine species, widely spread in north temperate regions.

1. **Carpinus americana,** Michx. Fl. Bor.-Am. ii. p. 201; Michx. f. Arb. iii. t. 8; A. Gr. Man. Bot. Northern U. S. ed. 5, p. 457; Chapm. Fl. Southern U. S. p. 425.

CANADA southward on the eastern side to FLORIDA.—GUATEMALA (*Bernoulli & Cario*, 2606, 2607). Hb. Kew.

[iii. p. 169.] 15. **Quercus confertifolia,** Humb. et Bonpl.; S. Wats. in Proc. Am. Acad. xviii. p. 156.

SOUTH MEXICO, Guanajuato (*Dugès*).

[iii. p. 170.] 20. **Quercus crassifolia,** Humb. et Bonpl.; S. Wats. in Proc. Am. Acad. xviii. p. 156.

North Mexico, in the San Miguelito Mountains, San Luis Potosi (*Schaffner*, 897), region of San Luis Potosi (*Parry & Palmer*, 836).

[iii. p. 172.] 41*. **Quercus grisea,** Liebm. Egesl. p. 13; DC. Prodr. xvi. 2, p. 35; S. Wats. in Proc. Am. Acad. xviii. p. 156.

New Mexico.—North Mexico, in the Sierra Madre south of Saltillo (*Palmer*, 1278).

SALICINEÆ.

[iii. p. 181.] 2*. **Populus fremontii,** S. Wats., var.? **wislizenii,** S. Wats. in Proc. Am. Acad. xviii. p. 157.

North Mexico, region of San Luis Potosi (*Schaffner*, 891; *Parry & Palmer*, 843).

GNETACEÆ.

[iii. p. 182.] 1*. **Ephedra aspera,** Engelm. MS.; S. Wats. in Proc. Am. Acad. xviii. p. 157.

Ephedra, sp. (4).

North Mexico, in the Sierra Madre south of Saltillo, Coahuila (*Palmer*, 1288), west of Cartamullo (*Gregg*).

[iii. p. 182.] 1**. **Ephedra pedunculata,** Engelm. MS.; S. Wats. in Proc. Am. Acad. xviii. p. 157.

Ephedra, sp. (2).

Texas.—North Mexico, Saltillo and Juraz, Coahuila (*Palmer*, 1289, 1290), region of San Luis Potosi (*Parry & Palmer*, 855; *Schaffner*).

CONIFERÆ.

[iii. p. 183.] **Cupressus arizonica,** Greene; S. Wats. in Proc. Am. Acad. xviii. p. 157.

Arizona.—North Mexico, in the Sierra Madre south of Saltillo (*Palmer*, 1293).

With regard to some of the other *Cupressineæ* collected by Parry and Palmer, Watson appears to have had different plants under some of the numbers from those in the Kew set, for his determinations do not agree with ours, even where we had type specimens before us.

[iii. p. 187.] 11*. **Pinus latisquama,** Engelm.; S. Wats. in Proc. Am. Acad. xviii. p. 158.

Through some confusion of specimens, the foliage of *Pinus ayacahuite* was figured for this species in the 'Gardener's Chronicle,' where it was first published.

[iii. p. 190.] 1. **Pseudotsuga douglasii,** Carr. iii. p. 190.

North Mexico, region of San Luis Potosi (*Parry & Palmer*); Seemann's 1963 from the Sierra Madre, cited under *Abies religiosa*, also belongs here.

[iii. p. 190.] 1*. **Abies,** sp. n.?

Guatemala (*Skinner*). Hb. Kew.

There is only foliage of this, but it is quite different from anything else found within our limits, and it is probably an undescribed species, near *Abies amabilis*.

ORCHIDEÆ.

[iii. p. 197.] The following Mexican orchids described by La Llave and Lexarza ('Orchidianum Opusculum') have not, so far as we can discover, been identified:—*Neottia papulosa*, *Satyrium vallisoletanum*, *Ophrys macrostachya*, *Cymbidium vexilliferum*, *Arethusa tigridiæfolia*, *Bletia punctata*, *Bletia coccinea*, *Pachyphyllum scandens*, *Oncidium hyalinobulbom*, *Pachyphyllum uniflorum*, *Epidendrum macrobulbon*, *Dendrobium aloideum*, and *Dendrobium bracteatum*.

[iii. p. 207.] 1*. **Masdevallia astuta,** Reichb. f. in Gard. Chron. n. s. xxvi. 1886, p. 584.

Costa Rica (*Corder*).

[iii. p. 213.] 4. **Corallorhiza punctata,** Mart. et Gal., is a doubtful species.

[iii. p. 220.] 3. **Hexadesmia crurigera,** Lindl.

Mexico (*Pavon*, ex Ridley in litt.). Mus. Brit.

[iii. p. 267.] *Maxillaria hæmatoglossa*, A. Rich. et Gal., is a synonym of **M. rhombea.**

[iii. p. 281.] 26. **Oncidium excavatum**: add Bot. Mag. t. 5293.

[iii. p. 290.] 1*. **Cryptarrhena lunata,** R. Br. in Bot. Reg. t. 153; Walp. Ann. vi. p. 698.

Mexico (*Pavon*, ex Ridley in litt.). Mus. Brit.

[iii. p. 292.] 83*. PACHYPHYLLUM.

Pachyphyllum, H. B. K. Nov. Gen. et Sp. i. p. 338, t. 77; Benth. et Hook. Gen. Plant. iii. p. 571.

1. **Pachyphyllum distichum,** H. B. K. Nov. Gen. et Sp. i. p. 339, t. 77; Walp. Ann. vi. p. 822.

Mexico (*Pavon*, ex Ridley in litt.).—Peru. Mus. Brit.

Mr. Ridley informs us there is also an undescribed species of this genus in the British Museum from Panama, collected by S. Hayes.

[iii. p. 294.] 1*. **Vanilla pfaviana,** Reichb. f. in Gard. Chron. 1883, n. s. xx. p. 230.

Mexico (*Pfau*).

[iii. p. 302.] 26*. **Spiranthes romanzoffiana,** Cham. in Linnæa, iii. p. 32; Reichb. Fl. Orchid. Germ. et Europ. xiii. p. 153, t. 477; A. Gr. Man. Bot. Northern U. S. ed. 5, p. 504.

Canada; Northern States.—Mexico (*Pavon*, ex Ridley in litt.).—Ireland. Mus. Brit.

[iii. p. 302.] The following species of *Spiranthes*, imperfectly described by A. Rich. et Gal. (in Ann. Sc. Nat. 3^{e} série, iii. pp. 31–33) have not been identified:—*S. hyemalis*, *S. lanuginosa*, *S. latifolia*, *S. luteo-alba*, *S. minutiflora*, *S. montana*, *S. ochracea*, *S. parasitica*, *S. pauciflora*, *S. pubens*, *S. sarcoglossa*, *S. transversalis*, and *S. violacea*.

[iii. p. 307.] *Habenaria acutiflora*, *H. adenantha*, *H. alata*, *H. brevilabiata*, *H. orizabensis*, *H. stricta*, *H. virens*, *Platanthera longifolia*, and *P. nubigena*, A. Rich. et Gal. (Ann. Sc. Nat. 3^{e} série, iii. pp. 28–30), are very imperfectly described, and probably the same, some of them, as those described under other names. *Gymnadenia neottioides* and *G. propinqua* of the same authors are also doubtful plants.

SCITAMINEÆ.

[iii. p. 313.] 3*. **Heliconia rostrata,** Ruiz et Pav. Fl. Peruv. t. 105; Rœm. et Schult. Syst. Veg. v. p. 592; Horan. Prodr. Monogr. Scit. p. 39.

Nicaragua (*Seemann*, 169, ex Ridley in litt.).—Peru. Mus. Brit.

[iii. p. 314.] BROMELIACEÆ.

1*. **Æchmea chiriquensis,** Baker in Journ. Bot. 1886, p. 243.

Panama, Chiriqui lagoon (*Hart*, 173). Hb. Kew.

IRIDEÆ.

[iii. p. 326.] 2*. **Tigridia dugesii,** S. Wats. in Proc. Am. Acad. xx. p. 375.

South Mexico, Guanajuato (*Dugès*).

[iii. p. 326.] 3*. **Tigridia meleagris,** Benth. et Hook. Gen. Plant. iii. p. 690. *Hydrotænia meleagris,* Lindl. Bot. Reg. 1838, p. 67, et 1842, t. 39.

South Mexico, Real del Monte (*Rogers*).

Hydrotænia ehrenbergii, Schl. in Linnæa, xviii. p. 666, is a very closely allied species from the same region.

[iii. p. 328.] 1. **Cipura paludosa,** Aubl.

Guatemala (*Bernoulli & Cario*, 802). Hb. Kew.

[iii. p. 328.] 1*. **Cipura cubensis,** Sauvalle, Fl. Cub. p. 166; Baker in Journ. Linn. Soc., Bot. xvi. p. 125.

GUATEMALA (*Lehmann*).—CUBA.

[iii. p. 328.] 7*. GELASINE.

Gelasine, Herb. in Bot. Mag. t. 3779, excl. spp. nn. 2 ad 4; Benth. et Hook. Gen. Plant. iii. p. 695.

Only one other species, which is a native of extratropical South America.

1. **Gelasine trichantha,** Baker in Engl. Jahrb. ined.

GUATEMALA (*Lehmann*).

LILIACEÆ.

[iii. p. 374.] 1*. **Anthericum (Phalangium) aurantiacum,** Baker in Engl. Jahrb. ined.

GUATEMALA (*Lehmann*).

[iii. p. 375.] 3*. **Anthericum (Phalangium) macrophyllum,** Baker, *l. c.*

GUATEMALA (*Lehmann*).

[iii. p. 376.] 1*. **Echeandia parviflora,** Baker in Engl. Jahrb. ined.

GUATEMALA (*Lehmann*).

[*Trachyandra nana*, *T. escheandoides*, and *Phalangium pusillum*, Schl. (Bot. Zeit. 1845), are, to us, doubtful Mexican Liliaceæ. *Phalangium flavescens*, Schl.,=*Anthericum flavescens*, Schult.]

COMMELINACEÆ.

[iii. p. 396.] **Campelia hoffmanni,** Hassk. in Flora, 1865, p. 105, =**C. zanonia,** H. B. K.

Add COSTA RICA, near San José (*Hoffmann*).

PALMÆ.

[iii. p. 403.] 2*. **Chamædorea atrovirens,** Mart. in Flora, 1852, p. 721.

SOUTH MEXICO, Oaxaca (*Karwinski*).

[iii. p. 412.] 18*. RAPHIA.

Raphia, Beauv. Fl. Ow. et Beu. i. p. 75, t. 44; Benth. et Hook. Gen. Plant. iii. p. 935.

An African and Mascarene genus of six or seven species, one of which occurs in Mexico.

1. **Raphia vinifera,** Beauv. Fl. Ow. et Beu. i. p. 77; var. *tædigera*, Drude in Bot. Zeit. 1876, p. 804, et in Fl. Bras. iii. 2, p. 287; Mart. Hist. Nat. Palm. iii. p. 216 (species propria); Wallace, Palm Trees, p. 43, t. 16.

Raphia nicaraguensis, Œrsted in Vidensk. Meddel. 1858, ex Drude.

NICARAGUA and COSTA RICA (ex *Drude*).—VENEZUELA; GUIANA; BRAZIL.

Typical *R. vinifera* is a native of Tropical Africa, and Drude is disposed to regard the American variety as a descendant of the same species, originally introduced from Africa either by human or natural agency. We have not succeeded in finding the name attributed by Drude to Œrsted without any reference to a page.

✓ [iii. p. 412.] 4*. **Bactris cohune,** S. Wats. in Proc. Am. Acad. xxi. p. 467.

GUATEMALA, abundant in the Chocou forests (*Watson*).

Several Palms not in our Enumeration are mentioned as growing within our limits in the narratives of various travellers; they will be dealt with in the general distribution of the order in the Appendix.

CYCLANTHACEÆ.

By an oversight the following members of this Order were omitted:—

[iii. p. 416.] **Carludovica gracilis,** Liebm. ined.?

SOUTH MEXICO, Jocotepec, Oaxaca (*Liebmann*). Hb. Kew.

We have not been able to ascertain whether this name has been published with a description, but Grisebach (Fl. Brit. W. Ind. p. 513) cites it as a synonym of *Carludovica angustifolia,* Seem. (*Evodianthus,* Œrst.). Liebmann's Mexican plant in the Kew Herbarium is, however, quite different from that from Costa Rica figured by Œrsted.

✓ **Carludovica ensiformis,** Hook. f. in Bot. Mag. t. 6418.

COSTA RICA. Cultivated specimens only in herb. Kew.

2*. **Carludovica palmata,** Ruiz et Pav. Syst. Veg. Fl. Peruv. p. 291; H. B. K. Nov. Gen. et Sp. i. p. 79; Kunth, Enum. Pl. iii. p. 105; Seem. Bot. Voy. 'Herald,' ✓ p. 204.

PANAMA, all over the country (ex *Seemann*).—COLOMBIA; PERU.

2**. **Carludovica plumieri,** Kunth, Enum. Pl. iii. p. 106; Griseb. Fl. Brit. W. ✓ Ind. p. 513.

PANAMA, Chiriqui (*Hart*).—WEST INDIES. Hb. Kew.

2. CYCLANTHUS.

Cyclanthus, Poit. in Mém. Mus. Par. ix. p. 35, tt. 2 et 3; Benth. et Hook. Gen. Plant. iii. p. 953.

About four or five species, inhabiting the West Indies and the northern part of South America.

1. **Cyclanthus bipartitus,** Poit. in Mém. Mus. Par. ix. p. 37, t. 3; Kunth, Enum. Pl. iii. p. 108?, ex Seem. Bot. Voy. 'Herald,' p. 205.

✓ PANAMA, banks of the river Pequeni (*Seemann*).—WEST INDIES; GUIANA.

2. **Cyclanthus,** sp.

NICARAGUA, Chontales (*Seemann*, 164). Hb. Kew.

TYPHACEÆ.

[iii. p. 416.] 1*. **Typha angustifolia,** Linn. Sp. Pl. ed. 1, p. 971; Griseb. Fl. Brit. W. Ind. p. 512, var. *domingensis*, Pers.; Hemsl. Bot. Chall. Exped. i. 1, p. 73.

SOUTH MEXICO, valley of Mexico (*Schmitz*, ex Ridley in litt.). Mus. Brit.

The species widely spread; and the variety ranges from Texas through the West Indies to Brazil.

NAIADACEÆ.

[iii. p. 442.] 2*. RUPPIA.

Ruppia, Linn. Gen. Plant. n. 175; Benth. et Hook. Gen. Plant. iii. p. 1014.

Species one, or several closely allied, generally spread in salt marshes in temperate and subtropical regions.

1. **Ruppia maritima,** Linn. Sp. Pl. ed. 1, p. 127; Griseb. Fl. Brit. W. Ind. p. 506; Chapm. Fl. Southern U. S. p. 445.

GUATEMALA (*Bernoulli & Cario*, 816).—TEMPERATE and SUBTROPICAL REGIONS. Hb. Kew.

CYPERACEÆ.

[iii. p. 451.] 61*. **Cyperus schaffneri,** Bœckl. in Engler's Jahrb. vii. p. 273.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 195).

This is not the species previously described by the same author under the same name, but as we are unable to compare them we prefer not renaming it.

[iii. p. 456.] 15*. **Heleocharis schaffneri,** Bœckl. in Engler's Jahrb. vii. p. 274.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 204).

[iii. p. 462.] 11*. **Scirpus (Oncostylis) schaffneri,** Bœckl. in Engler's Jahrb. vii. p. 275.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 202).

[iii. p. 463.] 1*. **Fuirena repens,** Bœckl. in Engler's Jahrb. vii. p. 277.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 196).

[iii. p. 472.] 1*. **Carex acutata,** Boott in Trans. Linn. Soc. xx. p. 124, et Ill. Carex, iv. p. 138, tt. 446 et 447; W. Boott in Coulter's Bot. Gazette, ix. p. 92.

SOUTH ARIZONA.—NORTH MEXICO, Huachuca Mountains (*Lemmon*).—COLOMBIA to CHILI and BRAZIL.

[iii. p. 473.] 7*. **Carex extensa,** Good. in Trans. Linn. Soc. ii. p. 175, t. 21.

fig. 7; Gray, Man. Bot. Northern U. S. ed. 5, p. 594; Boott, Ill. Carex, iv. p. 207; Bœck. in Linnæa, xli. p. 288.

Carex peruviana, Presl; Kunth, Enum. Pl. ii. p. 447.

NEW YORK.—MEXICO, San Pueblo (*Gregg*, ex Boott).—SOUTH AMERICA; EUROPE; WESTERN ASIA.

Mr. L. H. Bailey, jun., of Cambridge, U. S., writes that he is convinced that *C. peruvianus*, including presumably the Mexican specimens, is specifically distinct from *C. extensa.* Bœckler reduces the South-African *C. ecklonii*, Kunze, to a variety of this.

[iii. p. 473.] 8*. **Carex fuscolutea,** Bœckl. in Engler's Jahrb. vii. p. 278.

NORTH MEXICO, San Luis Potosi (*Schaffner*, 221).

[iii. p. 474.] 19*. **Carex rigens,** Bailey in Coulter's Bot. Gazette, ix. p. 117.

Carex sp., W. Boott, in Proc. Am. Acad. xviii. p. 172.

SOUTH ARIZONA.—NORTH MEXICO, region of San Luis Potosi (*Schaffner*, 547; *Parry & Palmer*, 917). Hb. Kew.

[iii. p. 474.] 22*. **Carex spissa,** Bailey, n. sp. "Tall (3–4 feet), stout, the culm very acutely angled; leaves stiff and carinate, conspicuously serrate on the margins, pale or glaucous; staminate spikes 3–5, long, approximate, scales narrow, acute; pistillate spikes 3–6, the lowest often long peduncled, the remainder sessile or nearly so, two to five inches long, very densely flowered except sometimes towards the base, often staminate at the apex; perigynium obovate, turgid, squamose, lightly few-nerved, almost beakless, the orifice slightly toothed, shorter than the rough-awned scale. Stigmas 3.—*C. hispida*, W. Boott, in part, Coulter's Bot. Gaz. ix. 89 (1884)."—*Bailey*, *MSS.*—See also Proc. Am. Acad. xxii. p. 70.

CALIFORNIA; ARIZONA.—MEXICO (ex *Bailey* in litt.).

GRAMINEÆ.

[iii. p. 475.] *Pogonopsis tenera*, Presl, Reliq. Hænk. i. p. 333, t. 46; Benth. et Hook. Gen. Plant. iii. p. 1096 (inter genera dubia), recorded from Mexico, is represented in the British Museum by an authentic specimen, which Mr. H. N. Ridley has examined and determined to be the common Asiatic *Pogonatherum crinitum*, Trin. It was therefore probably from the Philippine Islands instead of Mexico.

[iii. p. 485.] 4. **Panicum ascendens,** H. B. K., = **P. sanguinale,** Linn. fide Ridley in litt.

[iii. p. 498.] 94. **Panicum unisetum,** Presl, = **Setaria uniseta,** Fourn. huj. op. No. 24.

[iii. p. 524.] 3. **Heteropogon firmus,** Presl. Mr. H. W. Ridley, of the British Museum, has examined an authenticated specimen of this and declares it to be *H. contortus.*

[iii. p. 543.] **Muehlenbergia virescens,** Trin. Mr. Ridley identifies Parry and Palmer's 928, from San Luis Potosi, with this.

[iii. p. 561.] 3*. **Bouteloua disticha,** Benth.; S. Wats. in Proc. Am. Acad. xviii. p. 180.

Polyodon distichum, H. B. K. Nov. Gen. et Sp. i. p. 174, t. 55.

South Mexico, Cuernavaca (*Berlandier*, 1016, ex Ridley in litt.); Peru. Mus. Brit.

[iii. p. 576.] 87*. MELICA.

Melica, Linn. Gen. Plant. n. 82; Benth. et Hook. Gen. Plant. iii. p. 1189.

About thirty species, inhabiting Europe, temperate Asia, Africa, and North and South America.

1. **Melica imperfecta,** Trin. Sp. Gram. Ic. et Descript. iii. t. 355; S. Wats. Bot. Calif. ii. p. 303.

Oregon to California.—Mexico (*Mueller* ex Ridley in litt.). Mus. Brit

FILICES.

[iii. p. 592.] 3*. **Hemitelia (Amphicosmia) hartii,** Baker in Journ. Bot. 1886, p. 243.

Panama, Chiriqui lagoon (*Hart*, 43). Hb. Kew.

[iii. p. 615]. 7. **Cheilanthes leucopoda,** Link.

North Mexico, Chihuahua (*Pringle*). Hb. Kew.

This distinct species was previously not represented in the Kew Herbarium.

LYCOPODIACEÆ.

[iii. p. 703.] **Psilotum complanatum,** Swartz.

North Mexico, near the town of Chihuahua (*Pringle*).

[i. p. 94.] 3*. **Sauranja kegeliana,** Schl. in Bot. Zeit. 1853, p. 694.

Guatemala.

[i. p. 236.] *Varennea polystachya*, DC. Prodr. ii. p. 523, syn. *Viborquia polystachya*, Ort. Dec. v. p. 66, = **Eysenhardtia amorphoides.**

COZUMEL ISLAND.

ENUMERATION OF A SMALL COLLECTION OF PLANTS MADE IN 1885 BY F. GAUMER*.

THIS island is about twenty-five miles long, and about twelve miles from the coast of Yucatan, and the highest ground is not more than a few hundred feet above the level of the sea. As Mr. Gaumer is a zoologist rather than a botanist, it is uncertain to what extent the present collection represents the vegetation of the island; but from the nature of the collection generally, it may be assumed that it is a very good sample of the vegetation, and not a mere selection. An analysis follows the list. The species followed by a W. are found in the West Indies.

ANONACEÆ.

Asimina insularis, Hemsl. in Hook. Ic. Pl. t. 1514.

Foliis floribus coëtaneis, floribus solitariis oppositifoliis, petalis subæqualibus sesquipollicaribus 5–7-nerviis, carpellis sessilibus, ovulis 6 biseriatis.

Arbor 20-pedalis (*Gaumer*), ramis ultimis gracilibus pubescentibus, apice tantum foliiferis floriferisque. *Folia* flores coëtanea (juniora tantum visa), breviter petiolata, tenuia, molliter pubescentia, oblongo-elliptica, 1½–2½ poll. longa, acuta, basi cuneata vel interdum fere rotundata, venis primariis secondariisque conspicue subtus elevatis. *Flores* solitarii, oppositifolii, breviter pedunculati; pedunculi circiter 4 lineas longi, basi 1-bracteati, bractea ovato-oblonga obtusa subtus hirsuta pedunculum æquante; sepala ovata, vix acuta, circiter 4 lineas longa, extus piloso-hirsuta, longitudinaliter 7-nervia; petala subæqualia, lanceolato-oblonga, obtusa vel subacuta, sesquipollicaria, longitudinaliter 5–7-nervia, nervis dorso prominentibus hirsutis; anthera numerosa, sessilia, connectivo ultra loculos truncato expanso; carpella ad 6, sessilia, hirsuta; ovula 6, biseriata. *Fructus* deest.

"Not common" (*Gaumer*).

In all particulars except the number of ovules this is very closely allied to the large-flowered *Sapranthus nicaraguensis*, Seem. [see vol. i. p. 14], which, at the suggestion of Professor Oliver, we here reduce to *Asimina*, as *A. nicaraguensis*. *Asimina triloba* and other North-American congeners differ mainly in having axillary flowers and more numerous ovules. Whether *Porcelia*, Ruiz and Pavon, should be referred to the same genus we leave undecided; in any case, Adanson's *Asimina* is the older. Baillon ('Histoire des Plantes,' i. p. 199) unites these genera as a section of *Uvaria*. *Uvaria hahniana*, Baill., is probably of this affinity †.

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* This collection was presented to the Kew Herbarium, and Professor D. Oliver determined the whole of the plants as far as he could without much critical research; but Mr. Hemsley takes the responsibility of describing those believed to be new.

† Since the above was put in type, Dr. Asa Gray has published (Coulter's Bot. Gaz. 1886, p. 161) a revision of the genus *Asimina*, in which he takes a very different view of its limits, and retains *Sapranthus* as an independent genus.

PAPAVERACEÆ.

[i. p. 27.] **Argemone mexicana,** Linn. W.

CRUCIFERÆ.

[i. p. 40.] **Cakile maritima,** Scop., forma. W.

GUTTIFERÆ.

[i. p. 89.] **Mammea americana,** Linn. W.
Rare.

MALVACEÆ.

[i. p. 103.] **Sida carpinifolia,** Linn. W.

STERCULIACEÆ.

[i. p. 131.] **Melochia pyramidata,** Linn. W.

[i. p. 132.] **Melochia tomentosa,** Linn., var.? W.
This may be a distinct species; it is the same as Berlandier's 3032 from the Texano-Mexican region, and there is also a specimen in the Kew Herbarium, collected by Coulter, from Sonora Alta.

[i. p. 133.] **Guazuma tomentosa,** H. B. K. W.

MALPIGHIACEÆ.

[i. p. 146.] **Byrsonima crassifolia,** H. B. K., var. (*B. cumingiana,* A. Juss.). W.
Not common.

[i. p. 154.] **Hiræa barclayana,** Benth.?

ZYGOPHYLLACEÆ.

[i. p. 158.] **Tribulus maximus,** Linn. W.

RUTACEÆ.

Murraya exotica, Linn. W. Introduced from the Old World.

[i. p. 169.] **Zanthoxylon pterota,** Linn. W.
Not common.

SIMARUBACEÆ.

[i. p. 174.] **Picramnia antidesma,** Sw. W.

MELIACEÆ.

Trichilia terminalis, Jacq. Sel. Stirp. Am. p. 130; C. DC. in DC. Monogr. Phanerog. i. p. 66.
Trichilia sloanei, Macf. Fl. Jam. p. 168.
Acrilla sloanei, Griseb. Fl. Brit. W. Ind. p. 129.

Not common. This tree is common in Jamaica, but has hitherto not been found elsewhere.

[i. p. 181.] **Melia azedarach,** Linn.

Introduced from the Old World.

CELASTRINEÆ.

Myginda pallens, Smith?; Griseb. Fl. Brit. W. Ind. p. 146.

Very rare. This and *M. rhacoma,* Swartz, are very closely allied, and perhaps better treated as varieties of one species, ranging from the Bermudas, Bahamas, and Florida almost throughout the West Indies, but apparently not reaching Mexico or Central America.

[i. p. 194.] **Hippocratea (Pristimera) tenella,** Miers?

This may be specifically different from the Mexican plant, but the material is insufficient to settle the question.

AMPELIDEÆ.

[i. p. 204.] **Vitis tiliæfolia,** Willd. W.

ANACARDIACEÆ.

Rhus metopium, Linn. Amœn. v. p. 395; Griseb. Fl. Brit. West Ind. p. 175; Chapm. Fl. Southern U. S. p. 69.
Metopium linnæi, Engl. in DC. Monogr. Phanerog. iv. p. 367.

Rare.—BAHAMAS and SOUTH FLORIDA to JAMAICA and CUBA.

Spondias?

Only male flowers and quite young leaves.

LEGUMINOSÆ.

[i. p. 257.] **Tephrosia cinerea,** Pers. W.

Diphysa, sp. nov. ?, vel *D. sennoidei,* var.

Specimen insufficient for satisfactory determination.

[i. p. 262.] **Cracca caribæa,** Benth. ? W.

Cracca, sp. ?

A fragment.

[i. p. 274.] **Desmodium adscendens,** DC. W.

[i. p. 294.] **Centrosema virginianum,** Benth. W.

Gliricidia ?, sp. nov.

Tree, 50 feet; not abundant. In the absence of the fruit the genus of this tree cannot be satisfactorily determined.

Lonchocarpus violaceus ?, H. B. K., v. aff.

Tree, 20 to 60 feet; very abundant. *L. violaceus* is widely spread in the West Indies, and extends, according to Grisebach, to Venezuela and New Granada.

[i. p. 319.] **Piscidia erythrina,** Linn. W.

Very common.

[i. p. 325.] **Cæsalpinia pulcherrima,** Sw. W

Very abundant.

[i. p. 327.] **Cassia alata,** Linn. W.

Rare.

[i. p. 330.] **Cassia emarginata,** Linn.

Very abundant.

[i. p. 339.] **Bauhinia porrecta,** Sw. W.

Not abundant.

[i. p. 352.] **Acacia farnesiana,** Willd. W.

Not common.

[i. p. 355.] **Acacia spadicigera,** Ch. et Schl. ?

Abundant.

Lysiloma ?, sp. n. aff. *L. schiedeanæ.*

Tree, 25 to 100 feet; abundant. Fruit wanting.

Pithecolobium sericiflorum ?, Benth.

Vine, 10 to 50 feet; common. Typical *sericiflorum* inhabits Venezuela.

CRASSULACEÆ.

[i. p. 387.] **Bryophyllum calycinum,** Salisb. W.

COMBRETACEÆ.

Terminalia catappa, Linn. Mant. p. 519; Griseb. Fl. Brit. West Ind. p. 276; Hemsl. Bot. Chall. Exped. i. 3, pp. 150 et 292.

A native of the Old World, where it is widely dispersed, especially in maritime districts. It is also found wild in many of the West Indian Islands, where it may have been introduced by man or by oceanic currents, as the seed-vessels float and the seeds retain their vitality after long immersion in the sea.

[i. p. 403.] **Conocarpus erecta,** Linn. W.

MYRTACEÆ.

[i. p. 406.] **Psidium pomiferum,** Linn. W.

Eugenia, sp. nov. ?

Quite different from anything in the Kew Herbarium; but so many species of this vast genus have been described of which we have seen no authenticated specimens that we hesitate giving it a name.

LYTHRACEÆ.

[i. p. 448.] **Lawsonia alba,** Linn. W.

Introduced from the Old World.

PASSIFLORACEÆ.

Passiflora andersonii, DC. ? Prodr. iii. p. 236.

Vine, 30 to 60 feet; very abundant. The typical *andersonii* is a native of Santa Lucia and Dominica.

[i. p. 477.] **Passiflora fœtida,** Linn. W.

CUCURBITACEÆ.

[i. p. 482.] **Momordica charantia,** Linn. W.

Sicydium ?, sp. nov. (*Maximowiczia,* Cogn.)

Vine, 15 feet; rare. Foliage and male flowers only.

CACTACEÆ.

[i. p. 544.] **Cereus,** an *C. nycticalis* vel *macdonaldiœ*?

On trees; common.

CAPRIFOLIACEÆ.

[ii. p. 1.] **Sambucus mexicana,** Presl.

RUBIACEÆ.

Rhachicallis rupestris, DC. Prodr. iv. p. 434; Griseb. Fl. Brit. West Ind. p. 330; Hemsl. Bot. Chall. Exped. i. 1, p. 37.

Found only on the sea-shore; not abundant.—BERMUDAS to CUBA and JAMAICA.

This is the only species of the genus: it is placed next after *Rondeletia* by Bentham and Hooker.

[ii. p. 34.] **Hamelia patens,** Jacq. W.

[ii. p. 40.] **Randia aculeata,** Linn.; Griseb. Fl. Brit. W. Ind. p. 318, *β. mitis.*

[ii. p. 43.] **Randia latifolia,** Lam. W.

Randia? longiloba, Hemsl., n. sp.

Foliis in ramulis floriferis confertis tenuibus, floribus subsessilibus, corollæ lobis tubo multo longioribus, ovario 1-loculari.

Arbor 25-pedalis (*Gaumer*), inermis vel spinis paucis munita, undique glabra, ramulis ultimis floriferis brevibus crassis, internodiis obsoletis. *Folia* (juniora tantum visa) in ramulis floriferis conferta, graciliter petiolata, tenuia, ovali-elliptica vel oblongo-elliptica, cum petiolo usque ad 3½ poll. longa, obtusissima, simul mucronulata, basi valde attenuata, venis lateralibus primariis utrinque circiter 10, inconspicuis, longe intra marginem anastomosantibus. *Flores* albi (*Gaumer*), 5-meri, in apicibus ramulorum brevissimorum congesti, subsessiles, circiter 2 poll. diametro; calycis crassi subcarnosi tubus ultra ovarium productus, inter dentes tenuior, albescens, translucens, dentibus crassis brevibus vix acutis; corolla crassiuscula, hypocraterimorpha, fauce glabra, tubo quam lobi perspicue breviore; lobi in alabastram valde contorti, angusti, acuti, per anthesin patentissimi; stamina inclusa; discus carnosus, cupularis; ovarium 1-loculare, stylo incluso clavato profunde bifido; ovula in placentis 2 parietalibus numerosa. *Fructus* deest.

"Very common and very aromatic" (*Gaumer*).

In the absence of fruit, the genus of this tree cannot be satisfactorily determined; but, although it has only a one-celled ovary, it seems better to refer it to *Randia* rather than *Gardenia*, so long as the two genera are retained.

Coutarea octomera, Hemsl., n. sp.

Glabra, foliis parvis coriaceis, floribus octomeris semipollicaribus, calycis lobis linearibus, corolla anguste campanulata.

Frutex glaber, ramulis floriferis apice tantum foliiferis. *Folia* petiolata, coriacea, crassiuscula, oblongo-elliptica, cum petiolo 1–2 poll. longa, basi cuneata, apice rotundata simul mucronulata, supra nitida, subtus pallidiora, venis primariis utrinque circiter 4 subimmersis inter se intra marginem anastomosantibus; petiolus usque 4 lineas longus. *Flores* octomeri, semipollicares, breviter pedunculati, in apicibus ramulorum pauci; pedunculi circiter 3 lineas longi; calycis lobi ad 3 lineas longi, lineares vel subulati; corollæ anguste campanulatæ lobi breves, latiusculi, apice subcuculati; stamina 8, basi corollæ inserta, antheris filamentis longioribus breviter exsertis; ovarium 2-loculare, ovulis indefinitis biseriatis; stylus gracilis, indivisus, breviter exsertus, stigmate clavato. *Fructus* ignotus.

"Very rare; flowers greenish yellow" (*Gaumer*).

[ii. p. 44.] **Chiococca racemosa,** Jacq., varietates. W.

[ii. p. 46.] **Morinda roioc,** Linn. W.

Ernodea littoralis, Sw. Fl. Ind. Occ. i. p. 224; DC. Prodr. iv. p. 576; Griseb. Fl. Brit. West Ind. p. 347; Chapman, Fl. Southern U. S. p. 176.

Bush, 1 to 3 feet; abundant. A coast plant, extending from the BAHAMAS and FLORIDA to CUBA and JAMAICA.

Like *Rhachicallis*, this is a littoral monotype: it is placed next to *Triodon*.

[ii. p. 60.] **Spermacoce tenuior,** Linn. W.

COMPOSITÆ.

Eupatorium, sp.

"Rare. Flowers white tinged with dull yellow" (*Gaumer*).

There is an unnamed specimen in the Kew Herbarium of the same species, labelled "Yucatan and Tabasco, Torrey, 1850." It may, or may not, be an undescribed species.

Ageratum intermedium, Hemsl., n. sp.

Caulibus adscendentibus, foliis parvis petiolatis ovatis, cymis parvis longe pedunculatis, pedunculis nudis, achæniis 5-costatis, pappi paleis 5 fimbriatis quarum una tantum longe aristata.

Herba perennis?, parce albo-pilosa, caulibus adscendentibus floriferis superne aphyllis. *Folia* petiolata, mollia, ovata, absque petiolo usque ad 1½ poll. longa, vix acuta, basi rotundata, calloso-crenato-dentata, subtrinervia; petiolus usque ad 1 poll. longus, gracilis. *Capitula* mediocria, pauca in cymas longe pedunculatas disposita, pedunculis nudis, pedicellis bracteis linearibus ornatis; involucri bracteæ subbiseriatæ, rigidiusculæ, lineari-lanceolatæ, acutæ, longitudinaliter 2–3-costatæ, flores fere æquantes; receptaculum leviter convexum, epaleaceum, alveolatum. *Flores* indefiniti, purpurei (*Gaumer*), obscure puberuli; corollæ tubus deorsum gradatim attenuatus. *Achænia* glabra, prominenter 5-costata; pappi paleæ 5, longiusculæ, fimbriatæ, una sæpissime longe aristata.

"Abundant" (*Gaumer*).

This is intermediate in pappus between the common *A. conyzoides* and *A. muticum*;

and the plant doubtingly referred to *Alomia ageratoides* apparently differs from the present only in having white flowers and epappose achenes.

[ii. p. 79.] **Alomia ageratoides,** H. B. K.?

[ii. p. 123.] **Erigeron canadensis,** Linn. W.

[ii. p. 133.] **Pluchea purpurascens,** DC. W.

[ii. p. 145.] **Melampodium divaricatum,** DC.

Ambrosia hispida, Pursh, Fl. Am. Sept. ii. p. 743; A. Gr. Synopt. Fl. N. Am. i. 2, p. 250; Chapm. Fl. Southern U.S. p. 223.

Ambrosia crithmifolia, DC. Prodr. v. p. 525; Griseb. Fl. Brit. West Ind. p. 370.

Sea-shore, very abundant.—FLORIDA; BAHAMAS; TURK ISLAND; CUBA.

[ii. p. 148.] **Parthenium hysterophorus,** Linn. W.

[ii. p. 183.] **Melananthera hastata,** Michx. W.

[ii. p. 170.] **Wedelia carnosa,** Rich. W.

Borrichia arborescens, DC. Prodr. v. p. 489; Chapm. Fl. Southern U.S. p. 224; Griseb. Fl. Brit. West Ind. p. 371; Hemsl. in Bot. Chall. Exped. i. 1, p. 44, t. 2.

Bushy, about 3 feet; abundant on sea-shore.—BERMUDAS and SOUTH FLORIDA to GUADALOUPE, JAMAICA, CUBA, and PERU.

Spilanthes repens, Michx. Fl. Bor.-Am. ii. p. 131; A. Gr. Synopt. Fl. N. Am. i. 2, p. 258, var.?

Spilanthes nuttallii, Torr. et A. Gr. Fl. N. Am. ii. p. 356.

Marshy places; not abundant.—Gray gives the range of the species, as extended by him, from SOUTH CAROLINA to FLORIDA, ARKANSAS, and TEXAS.

[ii. p. 203.] **Bidens pilosa,** Linn. W.

[ii. p. 208.] **Tridax procumbens,** Linn. W.

[ii. p. 216.] **Flaveria linearis,** Lag. W.

CAMPANULACEÆ.

Isotoma longiflora, Presl, Prodr. Lob. p. 42; DC. Prodr. vii. p. 413; Griseb. Fl. Brit. West Ind. p. 388.

Not common.—Throughout the WEST INDIES; and there is also a specimen in the Kew Herbarium from GUATEMALA, which was overlooked before.

MYRSINEÆ.

[ii. p. 295.] **Jacquinia aristata,** Jacq. Fragm. t. 94, fig. 2; Griseb. Fl. Brit. West Ind. p. 397.

Jacquinia caracasana, H. B. K.; Biol. Centr.-Am. ii. p. 295. W.

SAPOTACEÆ.

Bumelia retusa, Sw. var.?; Griseb. Fl. Brit. W. Ind. p. 401.

Common.—Jamaica; Cuba.

APOCYNACEÆ.

[ii. p. 307.] **Thevetia neriifolia,** Juss. W.

Thevetia gaumeri, Hemsl. in Hook. Ic. Pl. t. 1517.

Foliis subcoriaceis oblanceolatis venis inconspicuis, floribus mediocribus, corollæ tubo calyce subæquali, lobis angustis oblique spathulatis, faucis squamis filamentisque barbatis, disco maximo carnoso.

Arbor 40–60-pedalis (*Gaumer*), omnino glaberrima, ramulis ultimis crassiusculis, nitidis. *Folia* petiolata, tenuiter coriacea, oblanceolata, cum petiolo usque ad 5 poll. longa $1\frac{1}{4}$ lataque, vix acuta, deorsum in petiolum sensim attenuata, supra nitida, subtus pallidiora, venis utrinque immersis inconspicuis. *Flores* citrini (*Gaumer*), mediocres, in cymas erectas subterminales 5–10-floras breviter pedunculatas dispositi, pedicellis $\frac{1}{2}$–1 poll. longis; calycis segmenta crassa, ovato-oblonga, abrupte breviterque acuminata vel apiculata, 4–5 lineas longa, corollæ tubum æquantia, basi intus multisquamulosa vel glandulosa; corolla infundibularis, sesqui- ad bipollicaris, tubo brevi, lobis oblique spathulatis, truncatis, faucis squamis albo-barbatis; stamina ad medium tubi inserta, filamentis complanatis medio pilis longis albidis rigidis dense barbatis; antheræ connectivo apice breviter graciliterque cornuto; discus cupularis, crassus, carnosus, ovarium cingens; ovarium glabrum, loculis biovulatis; stylus filiformis, infra stigma conoideum nudus, stigmate pilis albidis supra instructo. *Fructus* compressus, trigonus, apice $1\frac{1}{4}$ poll. latus, deorsum attenuatus, $\frac{3}{4}$ poll. longus, biapiculatus.

"Not common" (*Gaumer*).

The relatively short tube and narrow lobes of the medium-sized corolla, associated with inconspicuously veined leaves, are the most prominent characteristics of this species.

[ii. p. 309.] **Tabernæmontana acapulcensis,** Miers.

ASCLEPIADACEÆ.

[ii. p. 323.] **Asclepias curassavica,** Linn. W.

[ii. p. 337.] **Marsdenia maculata,** Hook. W.

GENTIANACEÆ.

[ii. p. 348.] **Eustoma exaltatum,** Salisb. W.

BORAGINACEÆ.

[ii. p. 367.] **Cordia dodecandra,** DC.

[ii. p. 367.] **Cordia globosa,** H. B. K., var. ? W.

[ii. p. 375.] **Heliotropium inundatum,** Sw. W.

[ii. p. 376.] **Heliotropium parviflorum,** Linn. W.

CONVOLVULACEÆ.

[ii. p. 384.] **Ipomœa (Calonyction) bona-nox,** Linn. W.

[ii. p. 388.] **Ipomœa (Pharbitis) jamaicensis,** Don. W.

[ii. p. 392.] **Ipomœa pes-capræ,** Linn. W.

Gaumer states that this ubiquitous tropical sea-shore trailing plant sometimes attains a hundred feet in length.

[ii. p. 397.] **Jacquemontia violacea,** Choisy. W.

[ii. p. 401.] **Cuscuta americana,** Linn. W.

SOLANACEÆ.

[ii. p. 404.] **Solanum amazonium,** Ker.

[ii. p. 412.] **Solanum nigrum,** Linn., var. W.

[ii. p. 417.] **Solanum verbascifolium,** Linn. W.

[ii. p. 423.] **Capsicum baccatum,** Linn. W.

[ii. p. 428.] **Datura stramonium,** Linn. W.

Cestrum diurnum, Linn. ? Griseb. Fl. Brit. W. Ind. p. 444.

Grisebach records this from the CARIBBEAN ISLANDS and CUBA only.

SCROPHULARINEÆ.

[ii. p. 446.] **Russelia sarmentosa,** Jacq. W.

[ii. p. 451.] **Herpestis monniera,** H. B. K. W.

[ii. p. 451.] **Herpestis chamædryoides,** H. B. K. W.

[ii. p. 455.] **Capraria biflora,** Linn. W.

BIGNONIACEÆ.

Bignonia, near *B. difficilis* and *B. diversifolia.*

"Vine, 10 to 30 feet long; not abundant" (*Gaumer*).

There is no fruit and only imperfect leaves of either this or the next.

Bignonia, sp.

"Vine 10 to 100 feet long; very abundant deep in the forest" (*Gaumer*).

ACANTHACEÆ.

[ii. p. 508.] **Blechum brownei,** Nees, var.? W.

Bravaisia tubiflora, Hemsl. in Hook. Ic. Pl. t. 1516.

Foliis parvis subcoriaceis venis inconspicuis, floribus subsessilibus hirsutis, corolla supra calycem in tubo stricte cylindrico subito constricta.

Arbor 25-pedalis (*Gaumer*), ramulis ultimis floriferis brevibus gracilibus minute puberulis. *Folia* petiolata, subcoriacea, ovali-elliptica, usque ad 3 poll. longa et 1½ poll. lata, superiora gradatim minora, cum bracteis obovato-spathulata, omnia cito glabrescentia, margine leviter incrassata, apice rotundata vel obtuse acuminata, basi cuneata, venis primariis utrinque 2–5 inconspicuis fere obsoletis. *Flores* albo-purpurei (*Gaumer*), circiter 1 poll. longi, in axillis foliorum solitarii, sæpius sessiles, bibracteati, bracteis spathulatis dimidio brevioribus; calycis segmenta persistentia fere æqualia, obtusissima vel rotundata, ciliolata, circiter 3 lineas longa; corolla subcampanulata, primum extus dense hirsuta, intus minus hirsuta, demum fere glabrescens, supra calycem in tubo cylindrico subito constricta; limbi lobis contortis brevibus subæqualibus rotundatis; stamina 4, didynama, inclusa, ad apicem tubi constricti inserta, filamentis parce pilosis, antheræ loculis basi breviter caudatis; ovarium glabrum, loculis biovulatis, ovulis adscendentibus, stylo gracillimo. *Capsula* ovoidea, crustacea, nitida; semina matura non visa.

"Not abundant" (*Gaumer*).

A specimen in the Kew Herbarium, in fruit, collected at Tlacotalpan, in Mexico, by Hahn, and formerly referred to *B. floribunda*, is evidently this species, which is readily distinguished by its smaller leaves, almost or quite sessile flowers, and especially by the hairy corolla being suddenly constricted into a cylindrical tube close above the calyx-segments.

[ii. p. 524.] **Dicliptera assurgens,** Juss. W.

VERBENACEÆ.

[ii. p. 527.] **Lantana camara,** Linn. W.

[ii. p. 528.] **Lantana involucrata,** Linn. W.

[ii. p. 530.] **Lippia nodiflora,** Michx. W.

Lippia stœchadifolia, H. B. K. Nov. Gen. et Sp. ii. p. 265; DC. Prodr. xi. p. 584; Griseb. Fl. Brit. West Indies, p. 495.

Not common.—Cuba to Guiana; and Grisebach records it from Mexico, but we have seen no specimens.

[ii. p. 532.] **Stachytarpheta jamaicensis,** Vahl. W.

[ii. p. 532.] **Priva echinata,** Juss. W.

[ii. p. 537.] **Duranta plumieri,** Jacq. W.

[ii. p. 538.] **Callicarpa acuminata,** H. B. K., var.

[ii. p. 540.] **Avicennia tomentosa,** Jacq. W.

LABIATÆ.

[ii. p. 547.] **Micromeria brownei,** Benth., forma calyce angustiore. W.

Salvia serotina, Linn. Mant. p. 25; DC. Prodr. xii. p. 298; Griseb. Fl. Brit. West Indies, p. 490; Chapm. Fl. Southern U. S. p. 319.

Common.—South Florida, and throughout the West Indies.

PLANTAGINEÆ.

[ii. p. 575.] **Plantago major,** Linn. W.

NYCTAGINEÆ.

[iii. p. 4.] **Boerhaavia erecta,** Linn. W.

AMARANTACEÆ.

[iii. p. 16.] **Mogiphanes straminea,** Mart. W.

[iii. p. 21.] **Iresine celosioides,** Linn. W.

PHYTOLACCACEÆ.

[iii. p. 28.] **Rivina humilis,** Linn. W.

POLYGONACEÆ.

[iii. p. 37.] **Antigonon leptopus,** Hook. et Arn.? (sepala exteriora basi subcordata).

Coccoloba cozumelensis, Hemsl., n. sp.

Arborescens fere undique glabra, foliis parvis tenuibus graciliter petiolatis stipulis cito deciduis, racemis gracilibus elongatis floribus singillatim dispositis, perianthii segmentis orbicularibus.

Arbor 30–50-pedalis (*Gaumer*), ramulis ultimis floriferis gracilibus, cum foliis floribusque fere omnino glabris. *Folia* breviter graciliterque petiolata, tenuia, fere membranacea, leviter oblique ovato-oblonga, cum petiolo 1–4 poll. longa, obtusa vel subacuta, basi rotundata vel subcordata, subtus præcipue secus costam parce pubescentia, venis primariis lateralibus utrinque 6–8, venulis ultimis minutissime reticulatis; stipulæ parvæ, membranaceæ, integræ, cito deciduæ. *Flores* albo-virides (*Gaumer*), 2–2½ lineas diametro, in racemos graciles usque ad 6 poll. longos dispositi, pedicellis brevissimis crassiusculis (nec fasciculatis), bracteis brevibus truncatis; perianthii tubus brevissimus; segmenta tenuia, orbicularia, staminibus paullo breviora. *Fructus* deest.

" Common " (*Gaumer*).

Without possessing any striking characteristics, this species is sufficiently distinct in its slender branchlets, thin leaves, and long slender racemes, in which the flowers are solitary (not fascicled), to be easily distinguished from all others known to us.

[iii. p. 37.] **Coccoloba uvifera,** Jacq. W.

LAURINEÆ.

[iii. p. 75.] **Nectandra willdenowiana,** Nees, varietates. W.

EUPHORBIACEÆ.

[iii. p. 95.] **Euphorbia heterophylla,** Linn. W.

[iii. p. 96.] **Euphorbia hypericifolia,** Linn. W.

[iii. p. 98.] **Euphorbia pilulifera,** Linn. W.

Euphorbia trichotoma, H. B. K. Nov. Gen. et Sp. ii. p. 60; DC. Prodr. xv. pt. 2, p. 105; Chapm. Fl. Southern U. S. p. 402.

Common on the sea-shore.—South Florida and Cuba.

Phyllanthus, sp. (*P. nutantis,* var. ?).

Not common.

Croton, sp., an *C. astroites,* Ait., var. ?

Without a label.

C. astroites, Ait., syn. *C. phlomoides,* Pers., is a common species in the West Indies.

AMARYLLIDEÆ.

[iii. p. 334.] **Hippeastrum equestre,** Herb. W.

LILIACEÆ.

[iii. p. 365.] **Smilax mexicana,** Kth.? var.

COMMELINACEÆ.

[iii. p. 387.] **Commelina erecta,** Linn.?

PALMÆ.

Thrinax, an *T. parviflora*, Sw.? Griseb. Fl. Brit. W. Ind. p. 515.
Very abundant.—Flowers only.

T. parviflora, Swartz, is apparently restricted to the West Indies, where it is gregarious in arid maritime districts in the BAHAMAS, JAMAICA, and HAYTI.

CYPERACEÆ.

[iii. p. 440.] **Cyperus ligularis,** Linn. W.
[iii. p. 452.] **Cyperus thyrsiflorus,** Jungh.

GRAMINEÆ.

[iii. p. 496.] **Panicum sanguinale,** Linn. W.
[iii. p. 565.] **Eleusine indica,** Gærtn. W.
[iii. p. 573.] **Eragrostis ciliaris,** Link. W.

FILICES.

[iii. p. 622.] **Pteris aquilina,** Linn., var. *caudata*. W.

Altogether there are 140 flowering plants and one fern, and of these 141 species, ninety are common to the West Indies and Mexico, or Central America; nineteen, including five doubtful ones, occur on the mainland, but are not known to be West-Indian; and twelve of them are essentially West-Indian species, not known to occur on the mainland, at least neither in Mexico nor in Central America. Then there is one south-eastern North-American species and four Old World colonists, leaving fifteen not identified with any described species, though half of these are perhaps not specifically distinct from known plants, the specimens being imperfect. Even those described as new species may exist on the opposite mainland, for very little is known of the vegetation of Yucatan. Taking present data, however, the Flora of Cozumel is probably more West-Indian than continental American in character; for, although the number of species, excluding doubtful ones, common to Cozumel and the continent but not found in the West Indies is somewhat larger than the number of West-Indian species found in Cozumel but not on the mainland, those of the latter category are of a more distinct type than those of the former. Thus *Rhachicallis* and *Ernodea* are very distinct monotypic genera—the former ranging from the Bermudas and Bahamas to Cuba and Jamaica, and the latter from Southern Florida and the Bahamas to Guadaloupe and Jamaica. *Rhus metopium*, which with one other Cuban species Engler has recently raised to the rank of an independent genus, is only West-Indian and Floridan; *Trichilia terminalis*, is a common tree in Jamaica, not recorded from elsewhere; and *Ambrosia hispida* and *Euphorbia trichotoma* are decidedly well-marked species restricted to the Floridan and West-Indian region; while the remainder are doubtful or less distinct. It is true that the majority of the plants named are essentially littoral. On the other hand, there is not one continental genus represented in the flora of Cozumel, so far as is known, which is not likewise West-Indian. *Sambucus* at first seemed to be a noteworthy exception, as the genus does not appear in Grisebach's 'Flora of the British West Indian Islands,' nor, apparently, in any other record; but on looking through the Kew Herbarium a specimen of a species of *Sambucus* was found labelled "St. Vincent, Rev. L. Guilding." It may or may not be the same species as that from Cozumel, and there is a possibility of a mistake, as there is no original label. The New World range of *Sambucus* is from Canada to North Florida and California, through Mexico and the Andes to Chili, South Brazil, and Buenos Ayres.

In composition Mr. Gaumer's collection of Cozumel plants offers almost a parallel to Professor Moseley's collection from Fernando Noronha*, probably owing to similar causes. Gaumer found only one species of fern—a form of the almost ubiquitous *Pteris aquilina*—Moseley none; Gaumer two or three petaliferous monocotyledons and five grasses and sedges—Moseley no petaliferous monocotyledons, but two or three more grasses. As in most insular floras, the proportion of genera to species is high in Cozumel: thus the 141 species belong to 121 genera and fifty-four natural orders. The only genera represented by more than two species are: *Ipomœa*, *Solanum*, and *Euphorbia*. Among the plants described as new, *Bravaisia tubiflora* is perhaps the most interesting, as it is the second species of the genus, the other ranging from Mexico to Peru and also occurring in Trinidad; and the new species is the same as a specimen collected by Hahn at "Tlacatalpan," probably Tlacotalpan, near the coast, in Vera Cruz.

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* See Hemsl. Bot. Chall. Exped. i. 2, p. 9.

A LIST OF PLANTS

FROM HOLBOX, MUGERES, COZUMEL, AND RUATAN ISLANDS, OFF THE COASTS OF YUCATAN AND HONDURAS, COLLECTED BY MR. G. F. GAUMER IN 1886 *.

C = Cozumel; H = Holbox; M = Mugeres; R = Ruatan.

Clematis dioica, *L.* C.
Cissampelos pareira, *L.* R.
Argemone mexicana, *L.* C.
Cakile æqualis, *L'Hérit.* M.
Cleome polygama, *L.* R.
Securidaca erecta, *L.* R.
  Griseb. Fl. Brit. W. Ind. p. 29.—West Indies, Guiana, and Brazil.
Sida carpinifolia, *L.* R.
—— cordifolia, *L.* R.
Hibiscus tiliaceus, *L.* R.
Malvaviscus, *near* M. pilosus, *DC.* R.; C.
Pachira aquatica, *Aubl.* R.
Triumfetta semitriloba, *L.* R.
Waltheria americana, *L.* R.; ? C.
—— ——, var.? H.
Muntingia calabura, *L.* R.
Byrsonima coriacea, *DC.*, var.? R.
Malpighia glabra, *L.* R.
—— undulata, *Juss.* C.
Stigmaphyllon humboldtianum, *Juss.* R.
Hiræa reclinata, *Jacq.*? R.
  Griseb. Fl. Brit. W. Ind. p. 121.—Trinidad, Venezuela.
Esenbeckia pentaphylla, *Griseb.* M.
  Fl. Brit. W. Ind. p. 135.—Jamaica.
Rutacearum gen. nov.? M.
Simaruba glauca, *Kth.*? R.
Suriana maritima, *L.* H.; M.
Gomphia nitida, *Sw.* R.
Trichilia, sp. nov.? R.
Salacia, sp. nov.?, *near* S. (Raddisia) grandiflora. R.
Elæodendron? M.
Vitis tiliæfolia, *Willd.* R.
Paullinia curassavica, *Jacq.*? C.
  Griseb. Fl. Brit. W. Ind. p. 124.—Jamaica, Colombia.
Ratonia apetala, *Gr.*? R.
Sapindus, *near* S. divaricatus, *Willd.* C.
Spondias lutea, *L.* R.
Mangifera indica, *L.* C.
Rourea glabra, *H. B. K.* R.
Crotalaria retusa, *L.* R.
  Griseb. Fl. Brit. W. Ind. p. 179.—A native of tropical Asia, widely colonized in America.
—— pumila, *Ort.* M.
Indigofera anil, *L.* C.
—— mucronata, *Spreng.* C.
Gliricidia maculata, *H. B. K.* C.
Tephrosia cinerea, *Pers.*, var.? R.

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* So little is known of the flora of the eastern side of Central America that it is desirable to publish this list, although the collection was not named in time to be utilized in the geographical tables in the Appendix. References to Grisebach's 'Flora of the British West Indies' are given after those species not in our Enumeration: these number about twenty-five. It will be seen that the majority of the plants are of widely diffused species, and the peculiar element only small. A *Rutacea* may prove the type of a new genus; but without fruit it is impossible to be sure on this point. The collection was presented by Mr. Godman to the Kew Herbarium.

Desmodium incanum, *DC.* R.; C.
Clitoria ternatea, *L.* R.
Rhynchosia minima, *DC.* R.; M.
Galactia, sp. C.
Phaseolus semierectus, *L.* R.
—— adenanthus, *G. F. Meyer*, var.? R.
—— lunatus, *L.* C.
—— vulgaris, *L.* C.
Vigna luteola, *Benth.* R.
Ecastaphyllum brownei, *Pers.* R.
——, sp. n.? R.
Piscidia erythrina, *L.* R.
Pterocarpus draco, *L.* R.
Lonchocarpus hondurensis, *Benth.* R.
—— latifolius, *H. B. K.* R.
Sophora tomentosa, *L.* M.
Cæsalpinia pulcherrima, *Sw.* R.
Cassia occidentalis, *L.* R.; M.
—— rotundifolia, *Pers.* R.
—— oxyphylla, *H. B. K.* R.
——, sp. C.; M.
Bauhinia porrecta, *Sw.* C.
——, *near* B. grandiflora. R.
Acacia farnesiana, *Willd.* C.
Desmanthus depressus, *H. B. K.* C.
Mimosa pudica, *L.* R.
—— asperata, *L.* R.
——, *near* M. costaricensis, *Benth.* R.
Pithecolobium oblongum, *Benth.* R.; M.
—— unguis-cati, *Benth.* M.
Griseb. Fl. Brit. W. Ind. p. 226.—Florida, West Indies, Venezuela.
Inga, *near* I. meissneriana? R.
Chrysobalanus icaco, *L.* R.; M.
Hirtella americana, *L.* R.
Rhizophora mangle, *L.* H.
Conocarpus erecta, *L.* R.; H.
Psidium pomiferum, *L.* R.
Jussiæa erecta, *L.* R.
—— suffruticosa, *L.* R.
Casearia, spp. R.
Turnera ulmifolia, *L.* R.
Passiflora fœtida, *L.* M.
Luffa ægyptiaca, *Mill.* R.
Carica papaya, *L.* C.
Hamelia patens, *Jacq.* C.
Ernodea littoralis, *Sw.* H.; M.
Griseb. Fl. Brit. W. Ind. p. 347.—Florida, West Indies.
Erithalis fruticosa, *L.* H.; M.
Strumpfia maritima, *Jacq.* M.
Griseb. Fl. Brit. W. Ind. p. 336.—West Indies.
Psychotria undata, *Jacq.* R.
Griseb. Fl. Brit. W. Ind. p. 342.—West Indies.
Spermacoce tenuior, *L.* R.; C.
—— verticillata, *Sw.* H.
Ageratum, sp. M.; R.
Eupatorium macrophyllum, *DC.* R.
—— paniculatum, *Schrad.* C.
——, *near* E. conyzoides, *Vahl.* C.
Brickellia diffusa, *A. Gray.* R.
Pluchea odorata, *DC.* M.
Bidens leucantha, *Willd.* R.
Eclipta erecta, *L.* R.
Melanthera deltoidea, *Rich.* R.; C.
Wedelia carnosa, *Rich.* R.
Parthenium hysterophorus, *L.* C.
Blainvillea dichotoma, *Cass.* C.
Venezuela to Brazil.
Melampodium divaricatum, *DC.* C.
Borrichia arborescens, *DC.* H.; M.
Griseb. Fl. Brit. W. Ind. p. 371.—Bermudas, Florida, West Indies, Peru.
Flaveria longifolia, *A. Gray.* H.
Spilanthes repens, *Michx* C.
A. Gray, Synopt. Fl. N. Am. i. p. 2.—Carolina to Florida and Texas.
Neurolæna lobata, *R. Br.* R.

Viguiera helianthoides, *DC.* C.

Senecio (Gynoxys), sp.? R.

Cnicus mexicanus, *Hemsl.* R.

Lycoseris squarrosa, *Benth.* R.

Scævola plumieri, *L.* M.; H.

Jacquinia aristata, *Jacq.* H.

Griseb. Fl. Brit. W. Ind. p. 397.—W. Indies, Venezuela.

Bumelia retusa, *Sw.*, var.? M.

Griseb. Fl. Brit. W. Ind. p. 401.—W. Indies.

Echites paludosa, *Vahl.* R.

Griseb. Fl. Brit. W. Ind. p. 415.—W. Indies.

Thevetia neriifolia, *Juss.* C.

—— nitida, *DC.* R.

Rauwolfia canescens, *L.* R.

Griseb. Fl. Brit. W. Ind. p. 407.—West Indies, Venezuela, Colombia.

Tabernæmontana, *near* T. acapulcensis, *Miers.* R.

Vallesia glabra, *Cav.* M.

Marsdenia maculata, *Hook.* R.

Asclepias curassavica, *L.* R.

Metastelma parviflorum, *R. Br.*? M.; H.; R.

Spigelia mexicana, *DC.* R.

Eustoma exaltatum, *Griseb.* H.

Nama jamaicensis, *L.* C.

Tournefortia gnaphalioides, *R. Br.* H.; M.

—— volubilis, *L.* M.

—— lævigata, *Lam.* R.

Cordia gerascanthus, *L.* M.

—— speciosa, *Willd.* M.

Griseb. Fl. Brit. W. Ind. p. 478.—West Indies, Guiana to Colombia.

Heliotropium indicum, *L.* R.

Ipomœa triloba, *L.* C.

—— sidæfolia, *L.* C.

Ipomœa fastigiata, *Sweet.* C.

—— umbellata, *Choisy.* R.

——, *near* I. acuminata. R.

—— coccinea, *L.* C.

—— acetosæfolia, *R. & S.* R.

Griseb. Fl. Brit. W. Ind. p. 471.—West Indies, Guiana, Brazil.

—— jamaicensis, *Don.* C.

Jacquemontia pentantha, *Jacq.* C.

Cuscuta americana, *L.* C.

Solanum nigrum, *L.*, var. M.

—— verbascifolium, *L.* C.

—— torvum, *Sw.* R.

—— callicarpæfolium, *Kunth & Bouché*? R.

—— nudum, *Kth.*? R.

——, sp. H.

Capsicum frutescens, *L.* C.

Lycium, *near* L. barbinodum, *Miers.* H.

Cestrum diurnum, *L.*? C.

Griseb. Fl. Brit. W. Ind. p. 444.—West Indies.

Russelia sarmentosa, *Jacq.* R.

Scoparia dulcis, *L.* R.

Capraria biflora, *L.* M.; H.; R.

Bignonia laurifolia, *V.* R.

Dicliptera assurgens, *Juss.* C.

Aphelandra pectinata, *Nees.* R.

Priva echinata, *Juss.* C.; R.

Petræa arborea, *Kth.* R.

Citharexylum caudatum, *L.*

Avicennia nitida, *Jacq.* H.

Callicarpa acuminata, *H. B. K.* R.

Stachytarpheta jamaicensis, *V.* R.; M.

Lippia nodiflora, *Rich.* R.; H.

Lantana odorata, *L.* R.; H.; M.

Lippia geminata, *H. B. K.* R.

——, sp. M.

Hyptis pectinata, *Poit.* C.; R.

Salvia serotina, *L.* M.

Boerhaavia erecta, *L.* C.
Bougainvillea spectabilis, *Juss.* R.—Introduced.
Celosia nitida, *Vahl.* M.
Chamissoa altissima, *Kth.* R.
Philoxerus vermicularis, *R. Br.* H.
Iresine celosioides, *L.* C.
Chenopodium ambrosioides, *L.* R.
Amarantus chlorostachys, *Willd.* R.
Atriplex cristata, *H. B. K.* H.
Suæda, sp. H.
Rivina lævis, *L.* C.; M.
Microtea debilis, *Sw.* R.
Coccoloba humboldtii, *Meissn.*? R.
Aristolochia fœtens, *Lindl.* R.
Piper, sp. R.
——, *near* P. bredemeyeri. R.
Nectandra willdenoviana, *Nees.* R.
——, sp. R.
Cassytha americana, *Nees.* H.
=C. filiformis, *Linn.*
Tragia volubilis, *L.* R.
Griseb. Fl. Brit. W. Ind. p. 48.—West Indies, Colombia, Guiana, Brazil.
Euphorbia pilulifera, *L.* R.
—— buxifolia, *Lam.* R.; H.; M.
—— hypericifolia, *L.* R.; C.
—— petiolaris, *Sims.* M.
—— cotinifolia, *L.* R.
Phyllanthus niruri, *L.* C.
Acalypha, *near* A. diversifolia. R.
—— alopecuroides, *Jacq.* C.
Argithamnia, sp. R.
Croton maritimus, *Walt.* H.
——, *near* C. glabellus, *M. Arg.* R.
Trema micrantha, *Bth. & Hk. f.* R.
Maranta, sp. R.
Tillandsia, sp.? H.
Canna indica, *L.*? R.; C.
Dioscorea densiflora, *Hemsl.* C.
Commelina nudiflora, *L.* R.—Widely spread.
—— virginica, *L.* R.; M.; C.
Sabal, sp. M.
Cyperus surinamensis, *Rottb.* R.
—— brunneus, *Sw.* M.; H.
Griseb. Fl. Brit. W. Ind. p. 565.—West Indies.
—— ligularis, *L.* R.
—— flexuosus, *Vahl.* R.
Griseb. Fl. Brit. W. Ind. p. 566.—West Indies, Brazil.
Fimbristylis polymorpha, *Bœckl.* H.
Rhynchospora cephalotes, *Vahl.* R.
Scleria bracteata, *Cav.* R.
Paspalum conjugatum, *Berg.* R.
Panicum sanguinale, *L.*, var. R.; C.
—— leucophæum, *H. B. K.* R.
—— divaricatum, *L.* R.
Griseb. Fl. Brit. W. Ind. p. 551.—West Indies.
Ichnanthes pallens, *Munro.* R.
Oplismenus sylvaticus, *R. & S.*? R.
Setaria glauca, *Beauv.* R.
Sporobolus indicus, *R. Br.* R.
—— jacquemontii, *Kth.* H.; R.
Chloris petræa, *L.* H.
Eleusine indica, *Gaertn.* C.; M.; R.
—— ægyptiaca, *Pers.* (Dactyloctenium ægyptiacum, *Willd.*) H.
Leptochloa domingensis, *Link.* R.
—— —— (perhaps =L. virgata). C.
Eragrostis ciliaris, *Link.* C.; M.; H.
Adiantum trapeziforme, *L.* R.
Gymnogramme calomelanos, *Kaulf.* R.
Pteris aculeata, *Sw.* R.
Lygodium venustum, *Sw.* R.
—— volubile, *Sw.* R.

COSTA-RICAN FERNS.

On page 589 of the third volume of this work it is stated that the Kew Herbarium contained only about fifty species of Ferns from Costa Rica. That number has now been increased to 134 by a collection made by Mr. J. J. Cooper, and communicated to Kew by the Trustees of the National Museum, Washington, U.S. This collection of Ferns was obligingly offered to the writer for the purposes of this work, and, as Mr. Baker kindly undertook to name them, the offer was accepted, on the condition that Kew received the first set. Independently of four new species, there are fifteen * in the following list not previously recorded from any part of our territory; but as the summary and analysis of the flora was all written before the names of this collection were available, they are not included therein. To add them now would involve the alteration of many figures, some of which would almost certainly escape notice; and such alterations would not materially affect any question concerning the general distribution of Ferns; therefore it appears better to be content with a cross reference to this Supplement.

Gleichenia pectinata, *Presl.*

—— dichotoma, *Hook.*; *Hook. et Bak. Syn. Fil.* p. 15.—Almost universal in the tropics.

—— intermedia, *Baker*, n. sp., *in Journ. Bot.* 1887, p. 24.

Cyathea arborea, *Sw.*

—— divergens, *Kunze*; *Hook. et Bak. Syn. Fil.* p. 18.—Colombia to Peru.

Hemitelia horrida, *R. Br.*; *Hook. et Bak. Syn. Fil.* p. 28.—West Indies and Colombia.

Hymenophyllum ciliatum, *Sw.*

—— polyanthos, *Sw.*

—— myriocarpum, *Hook.*

Trichomanes crispum, *Sw.*

—— rigidum, *Sw.*

Dicksonia cicutaria, *Sw.*

Dicksonia incisa, *Fée*; *Hook. et Bak. Syn. Fil.* p. 462.

—— rubiginosa, *Kaulf.*

Davallia inæqualis, *Kunze.*

—— imrayana, *Hook.*; *Hook. et Bak. Syn. Fil.* p. 90.—West Indies, Guiana.

—— schlechtendalii, *Presl.*

Lindsaya trapeziformis, *Dry.*

—— guianensis, *Dry.*; *Hook. et Bak. Syn. Fil.* p. 107.—West Indies to Brazil.

Adiantum tenerum, *Sw.*

—— patens, *Willd.*

—— cooperi, *Baker*, n. sp., *in Journ. Bot.* 1887, p. 25.

Lonchitis pubescens, *Willd.*; *Hook. et Bak. Syn. Fil.* p. 128.—Widely spread in tropical regions. The genus is new to our flora.

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* References to the 'Synopsis Filicum' and their distribution are added after these species.

Hypolepis repens, *Presl.*
Cheilanthes lendigera, *Sw.*
Pellæa angustifolia, *Baker.*
Pteris aquilina, *L.*
—— quadriaurita, *Retz.*
—— palmata, *Willd.*
—— incisa, *Thunb.*
Lomaria attenuata, *Willd.*
—— procera, *Spreng.*
Blechnum longifolium, β. fraxineum, *Willd.*
—— volubile, *Kaulf.*; *Hook. et Bak. Syn. Fil.* p. 187.—West Indies to Brazil and Peru.
Asplenium serratum, *L.*
—— monanthemum, *L.*
—— lunulatum, *Sw.*
—— anisophyllum, *Bunge.*
—— serra, *L. & F.*
—— abscissum, *Willd.*
—— auriculatum, *Sw.*
—— auritum, *Sw.*
—— cicutarium, *Sw.*
—— bulbiferum, *Forst.*
—— radicans, *Schk.*
—— lindbergii, *Mett.*
—— neglectum, *Karst.*; *Hook. et Bak. Syn. Fil.* p. 490.—Colombia and South Mexico, though previously overlooked.
Didymochlæna lunulata, *Desv.*
Aspidium juglandifolium, *Kunze.*
—— trifoliatum, *Sw.*
Nephrodium filix-mas, *Rich.*
—— patens, *Desv.*
—— villosum, *Presl.*
Oleandra neriiformis, *Cav.*; *Hook. et Bak. Syn. Fil.* p. 302.—Widely diffused in the tropics.
—— nodosa, *Presl.*
Polypodium trichomanoides, *Sw.*
—— pectinatum, *L.*
—— plebeium, *Schlecht.*
—— cheilosticton, *Fée.*
—— incanum, *Sw.*
—— thyssanolepis, *A. Br.*
—— squamatum, *L.*
—— piloselloides, *L.*
—— glaucophyllum, *Kunze*; *Hook. et Bak. Syn. Fil.* p. 340.—West Indies and Colombia to Ecuador; also W. Africa.
—— loriceum, *L.*
—— catherinæ, *L. & F.*; *Hook. et Bak. Syn. Fil.* p. 343.—Brazil.
—— chnoodes, *Spreng.*
—— neriifolium, *Schk.*
—— angustifolium, *Sw.*
—— lanceolatum, *L.*
—— crassifolium, *Sw.*
—— percrassum, *Baker*, n. sp., *in Journ. Bot.* 1887, p. 26.
—— aspidiolepis, *Baker*, n. sp., *in Journ. Bot.* 1887, p. 26.
Gymnogramme ferruginea, *Kunze.*
—— trifoliata, *Desv.*
Vittaria lineata, *Sw.*
Antrophyum ensiforme, *Hook.*
Acrostichum flaccidum, *Fée*; *Hook. et Bak. Syn. Fil.* p. 401.—Colombia to Brazil.
—— lingua, *Raddi*; *Hook. et Bak. Syn. Fil.* p. 402.—West Indies to Brazil and Peru.
—— hybridum, *Bory.*
—— spathulatum, *Bory.*
—— vicosum, *Sw.*
—— bellermannianum, *Klotzsch.*
Marattia laxa, *Kunze.*
Danæa moritziana, *Presl.*

APPENDIX.

PRELIMINARY REMARKS.

Now that the laborious Enumeration has been brought to an end, we have to enter upon the more congenial portion of our task relating to the distribution of the plants. This might be approached from a variety of aspects, and it might be extended almost indefinitely, especially in the examination and discussion of the various theories put forward by different writers; but, as it is the intention of the Editors to publish an Introductory Volume at the conclusion of the much more extensive zoological portion of the work, embracing the whole subject, we shall confine ourselves almost exclusively to an exposition of the facts. For the same reason the physical geography and climatology will only be dealt with in a very general way, and the geology will not be touched. But while these subjects have been either altogether neglected or very briefly treated, the distribution of the plants has been almost exhaustively tabulated and analyzed. In the tedious process of compiling the tables and collecting the materials for the various sections of this Appendix, the writer has been very ably assisted by Miss Matilda Smith. The figures have almost invariably been obtained by one and checked by the other, and thereby it is hoped that serious errors have altogether been avoided. It is important to note that the geographical tables were not literally compiled from the Enumeration, otherwise persons using the work would find themselves confronted with numerous unaccountable discrepancies; but the nature and extent of the eliminations and modifications made are explained in the paragraph preceding the first of the tables.

As each section of the present Appendix contains all that seems necessary to make it intelligible in itself, it is unnecessary to enter into further particulars here, especially as the object and scope of the work are set forth in the Preface to the first volume, and the contents of the present volume are fully summarized at the beginning.

A SKETCH OF THE HISTORY OF THE BOTANICAL EXPLORATION OF MEXICO AND CENTRAL AMERICA.

THIS must necessarily be brief and imperfect; but the subject could not properly be omitted altogether. *Francisco Hernandez*, physician to Philip II. of Spain, was the first European who investigated the flora of Mexico, though from a medicinal rather than a botanical standpoint *. He spent six years in Mexico, chiefly in the State of Mexico, from 1571 to 1577 †, and must have worked most assiduously; but the greater part of the fruit of his labours was destroyed in the great fire at the Escurial in 1671. Fortunately, however, his manuscripts relating to plants and animals escaped, and were published, or some portion of them, in 1615 ‡. We have not seen this work, of which, according to Pritzel §, there is a copy in the Imperial Library at Vienna; but of the much fuller and more interesting 'Rerum Medicarum Novæ Hispaniæ' ||, published in 1651, there is an excellent copy at Kew. This is a folio book of about a thousand pages, containing numerous woodcut illustrations of plants and animals, chiefly of the former, and mostly recognizable, and some very good. Conspicuous among the flowers in the ornamental head- and tail-pieces are *Tigridia*, *Cheirostemon*, and the famous "Flos Lyncei," probably *Stanhopea tigrina*. These singular forms must have greatly excited the curiosity of those interested in flowers, long before any attempt was made to introduce living plants of them into European gardens. Many years after the publication of the work described, five manuscript volumes of Hernandez's works, containing many corrections in the handwriting of Hernandez himself, were found in the library of San Isidro, Madrid, and those relating to botany were published under the superintendence of Gomez Ortega in 1790 ¶. As this work is not illustrated it is less intelligible than the 'Rerum Medicarum.'

Proceeding with this history in chronological sequence, or as nearly so as our data will permit, *Dr. William Houston*, F.R.S., appears to be the next person deserving notice here on account of his connexion with Mexican botany. He studied during two years at Leyden, under Boerhaave **, from whom, probably, he imbibed a taste for botanical pursuits; and on going to the West Indies in 1729, and later to Mexico, he sent seeds of numerous plants to Philip Miller, the "Hortulanorum Princeps" of his time, and Superintendent of the Apothecaries' Garden at Chelsea, where he raised and cultivated many of the plants thus introduced. Houston's name is frequently mentioned in Miller's incomparable 'Gardener's Dictionary' as the collector of plants

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* Colmeiro, M., 'La Botánica y los Botánicos de la Peninsula Hispano-Lusitana,' 1858: an admirable work, to which we are indebted for most of the particulars in this Sketch concerning Spanish botanists and collectors.

† Lasègue, A., 'Musée Botanique de Delessert,' 1845, gives the period as from 1593 to 1600. From this work also we have gleaned much information; and in all cases where we cite Lasègue as our authority it is in connexion with this book.

‡ Quatro libros de la Naturaleza y virtudes de las Plantas y Animales, que están recevidos en el uso de Medecina en la Nueva-España, publicado en Méjico por Ximenez en el año 1615.

§ Thesaurus Literaturæ Botanicæ omnium Gentium.

|| Hernandez, F., Rerum Medicarum Novæ Hispaniæ Thesaurus, seu Plantarum, Animalium, et Mineralium Mexicanorum Historia. . . . a Nardo Antonio Reccho collecta ac in ordinem digesta. Roma, 1651.

¶ Historia Plantarum Novæ Hispaniæ.

** Pulteney, 'Sketches of the Progress of Botany,' ii. p. 231.

therein described; but more conspicuous evidence of his activity exists in John Martyn's 'Historia Plantarum Rariorum' (1728–1732), "the most sumptuous and magnificent work of the kind that had ever been attempted in England." In this work are coloured engravings of the genera *Gronovia*, *Milleria*, *Martynia*, and *Turnera*, various species of *Passiflora* and other plants, introduced, as we are informed, by Houston. This was just before the publication of Linnæus's binominal nomenclature; but the Linnean names were subsequently added on a flyleaf at the beginning of the volume. During his short sojourn in the West Indies, from 1728 to 1733, when he died a victim to the climate, Houston drew up a catalogue of the plants he had collected, wrote a treatise on contrayerva, jalap, and other Mexican medicinal plants, and engraved with his own hand analyses of the flowers and fruits of various new genera, after the manner of Plumier *. These engravings passed into the possession of Miller, who sent copies of them to Linnæus; and later, after Miller's decease, they were purchased by Sir Joseph Banks, and published by him in 1781 under the title 'Reliquiæ Houstonianæ.' They mostly represent Mexican plants, and they bear the names given to them by Linnæus. Houston's dried specimens are in the British Museum.

In continuing this sketch, it will save space and unnecessary repetition of various particulars if some of the minor collectors are mentioned under those of the first rank of about the same period; hence that course will be adopted, where practicable.

Luis Née.—A Frenchman, naturalized in Spain, and one of the botanists who accompanied Malaspina on his voyage round the world. He was a most indefatigable collector, and was endowed with considerable scientific ability. On the authority of Colmeiro, Née was the first to make the interesting discovery of the existence of *Rhododendron ponticum* in the Iberian peninsula. Malaspina's voyage was made during the years 1789 to 1794, and when Née landed at Cadiz he had made a collection of dried plants estimated at 10,000 species, including 4000 new to science. Like many other fine collections made by Spanish naturalists, it has been permitted to lie at Madrid unused. There were also upwards of three hundred drawings by various artists.

Thaddæus Hænke, a Bohemian by birth, was also to have accompanied Malaspina; but he arrived at Cadiz twenty-four hours after the ship had sailed. He followed in another ship, hoping to find Malaspina at Monte Video or Buenos Ayres, failing which he traversed the American continent to Chili, where he fell in with Née, and the two subsequently botanized together in various parts of the world, including Mexico †.

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* Rees' Cyclopædia.

† Presl, 'Reliquiæ Hænkeanæ,' i. Pref. p. xi, has the following note with reference to the Mexican journey:—"Mense Novembri profectus est Thaddæus Hænke solus ad urbem capitalem Mexico, et Decembri reversus est ad Acapulco. Fructus hujus itineris consistit quinque fasciculis quibus verba: *Iter Mexicanum et Plantæ Mexicanæ* inscripta sunt."

They travelled from Acapulco to the city of Mexico, though it would appear that they did not diverge much from the beaten tracks. Hænke's plants are in the Prague, Vienna, and other continental herbaria. Presl elaborated these collections in two illustrated volumes entitled 'Reliquiæ Hænkeanæ.' Some of the types are in the British Museum, and a few, chiefly *Cyperaceæ*, at Kew; the latter formed part of Bishop Goodenough's herbarium, recently presented to Kew by the Corporation of Carlisle.

Martin Sessé.—A Doctor of Medicine and a botanist, who was made leader of an expedition for the scientific exploration of New Spain, sent out in 1795 by Charles IV. of Spain. José Mariano Mociño and Vicente Cervantes were associated with him in this work. The latter afterwards became Professor of Botany at Mexico city, where he died in 1829 at the age of seventy years *. He was the first who publicly lectured on botany in Mexico; and he appears to have kept up a correspondence with European botanists, among whom was Lambert; for we find that several Mexican plants were raised in Lambert's garden from seeds sent by Cervantes—*Nocca latifolia* (*Lagascea*) in Sweet's 'British Flower Garden,' series 1, plate 215, for example. Sessé and Mociño spent eight years, from 1795 to 1804, in the botanical exploration of Mexico and the adjoining countries, from Punta Arenas in Costa Rica to the mouth of the river Hiaqui or Yaqui in north-western Mexico; afterwards visiting California and the West Indies. This expedition seems to have been conducted with great skill, industry, and devotion; yet to this day the results have not been published, except a few fragments, and these by foreigners. The fruit of these journeyings, Colmeiro states, was a considerable herbarium, which reached the Madrid botanic garden in 1820, and was incorporated in the general collection. There was also a fine set of about 1400 coloured drawings of Mexican plants, executed by Atanasio Echevarria, a Mexican, and Juan de Dios Cerda, both clever artists whose names are commemorated in the genera *Echeveria* (now a section of *Cotyledon*) and *Cerdia*, a singular genus of the Caryophyllaceæ recently rediscovered by Parry and Palmer in San Luis Potosi. By some means a small portion of Mociño and Sessé's herbarium came into Lambert's possession, and at his death it was purchased for Delessert. During the time these plants were in Lambert's possession David Don described a number of them, including the genus *Cowania* and various Compositæ †. It is conjectured, too, that the large number of Mexican plants in Pavon's collections at Kew and the British Museum formed part of Mociño and Sessé's herbarium ‡. This is very probable, as Pavon himself was never in Mexico, and there is evidence of his having dealt freely in the sale of dried plants. Through Mociño, the collection of drawings alluded to, and various manuscripts, passed into the hands of the elder DeCandolle for publication, and 271 species, including seventeen new genera, were founded on the drawings alone. Shortly before his death, and somewhat unexpectedly and peremptorily, Mociño requested that the drawings should be returned to him. How the whole of them were copied, with the assistance of about a hundred ladies, in ten days, is a matter of history. Since then, through the generous consideration of Mr. Alphonse DeCandolle, the principal botanical establishments have acquired tracings of all the drawings on which published species had been founded, except a few which had previously been engraved for some of the 'Mémoires' of A. P. DeCandolle. A copy in the Kew Library has been of the greatest service in determining many doubtful species.

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* 'Flora,' 1830, p. 693.

† Transactions of the Linnean Society, xiv. p. 573, and xvi. p. 169.

‡ Lasègue, 'Musée Delessert,' p. 322.

In the Kew herbarium is a small collection of Mexican plants presented to the late Sir William Hooker by a person named Tate, probably Mr. Tate, a nurseryman of Sloane Street, London, who, early in the present century, was an enterprising cultivator of Mexican plants obtained through various channels. It is probable that the dried plants in question were received from Mociño; we say probable, because they correspond to plants described by DeCandolle from Mairet's herbarium, concerning which we believe it is somewhere recorded, though we cannot recollect where, that Mairet came into possession of some of Mociño's dried plants. The Kew specimens in question are accompanied by labels bearing the same manuscript names cited by DeCandolle from Mairet's herbarium, though not the same numbers. *Senecio vernus*, De C., is an example, the manuscript name being *Cineraria vernix*, which was probably converted into *vernus* by a slip of the pen, especially as the latter name has no particular application to the plant, and the former has.

Alexander Humboldt and *Aimé Bonpland.*—The great scientific expedition led by the master mind of his time is too well known to need much more than passing reference here. It was entered upon in 1799 and terminated in 1804—the materials amassed being sufficient to occupy a long and active life, to say nothing of the labours of others. In several branches of inquiry we are still no further advanced than he was, though his Mexican botanical collections were comparatively small, amounting, according to Kotschy *, to 956 species belonging to 380 genera. These, as we learn from the authors themselves †, were collected within a period of ten months, and in parts of Mexico lying between the seventeenth and twenty-first parallels of latitude. The routes and regions are, briefly:—1. Western slopes of the Mexican Andes, from the shores of the Pacific Ocean to Lake Tezcuco; 2. Elevated Plains of Mexico, temperate and frigid regions, from the valley of Mexico by Anahuac, El Baxio, and Michoacan to the mines of Guadalajara; 3. Eastern slopes of the Mexican Andes, from Perote to the Atlantic Ocean. A fuller explanation will be found in the work cited, together with the various excursions made from the main routes, and the names and altitudes of all the principal localities, temperatures, &c.

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* "Ueberblick der Vegetation Mexicos" (Sitz. Ber. Akad. Wiss. Wien. viii. 1852).

† Nova Genera et Species Plantarum, vii. p. 433.

Bonpland was the actual collector of the plants. He was born in 1773 at La Rochelle, where his father practised as a doctor*. The son was educated for the same profession, and on going to Paris to complete his studies he there became acquainted with Alex. v. Humboldt in 1798. Subsequently they undertook their famous expedition to America, which is described by Humboldt under the title 'A Journey to the Equinoctial Regions of the New World.' Bonpland collected more than 6000 species of plants during the expedition, which he afterwards presented to the Museum at Paris. Napoleon, in gratitude, awarded him a pension, and he was made Steward to the Empress Josephine at Malmaison. In 1816 he decided to settle in America, and went to Buenos Ayres, where he was made Professor of Natural History. After some time he resolved to undertake a journey over the Pampas, to Santa Fé, Gran Chaco, and Bolivia, for the purpose of further exploring the Andes; but he was stopped by Dr. Francia, then Dictator of Paraguay, and kept a prisoner at Santa Maria for more than nine years, till 1831. On his release he settled at San Borja in Corrientes, and devoted himself to cultivating his estates and to making short excursions from time to time into La Plata &c. for natural-history purposes. In 1849 he received the Cross of the Legion of Honour, was made Head Director of the Natural-History Museum of Corrientes, and died at San Borja in 1858, leaving his collections, books, and manuscripts to the French Marine Ministry.

An interval of twenty years elapsed between the visit of Humboldt and Bonpland and the next Europeans on our list who visited Mexico for the express purpose of investigating its natural history. In point of date, however, a native of Mexico occupies the next place.

Juan Lexarza, a native of Valladolid, in Michoacan, Mexico, was born in 1785, and after he had grown up he became acquainted with Pablo La Llave, a Spanish priest, distinguished for his knowledge of botany, who gave him his first instructions in this science. In 1824–25 they published conjointly a number of new genera of Mexican plants, mostly named after eminent contemporaries, and a number of orchids, chiefly natives of the State of Michoacan; Lexarza being the principal author, and the sole author of a new classification of orchids, based upon their seeds and pollen. This is reproduced in the 'Bonplandia' for 1856, p. 26. Lexarza gave promise of making an accomplished botanist, but he attempted too much and was cut off young. Several of his orchids have not been identified in consequence of the descriptions being imperfect. David Don mentions† having received a small collection of dried plants from Don Pablo La Llave, by which he became acquainted with the genera of Compositæ described in the 'Descriptiones Novorum Vegetabilium.' These plants formed a part of Lambert's herbarium, which was subsequently dispersed in small lots; some having been purchased for continental museums.

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* Bonplandia, 1854, p. 259.

† Transactions of the Linnean Society, xvi. p. 170.

In 1825 a new period of activity set in, and continued almost unbroken for many years; but few of the numerous travellers had received a scientific training, hence the botanical results were by no means so satisfactory as they might have been. Indeed, the principal object of many of these travellers was the introduction of living plants into European gardens.

Carl Sartorius left Darmstadt in 1825 or 1826 on account of political disturbances, and took refuge in Mexico, where in 1830 he bought some land at Mirador, at the foot of the Orizaba mountain-chain, and devoted himself to its cultivation. He made large collections of plants at every opportunity, and on his death in 1872, on his Hacienda at Mirador, he left his herbarium to the Smithsonian Institution at Washington. He was soon followed by several others. Here and there we find a plant in the Kew Herbarium collected by Sartorius, and acquired in exchange from Berlin.

Wilhelm Friedrich von Karwinski, a Bavarian naturalist, who had already travelled in Brazil, was sent to Mexico in 1826 by the German-American Mining Society of Dusseldorf and the Bavarian Government, to make collections of objects of Natural History. He remained five years, chiefly in the province of Oaxaca, and sent home great numbers of living plants (especially Cactaceæ and Agaves) from there and from Ismiquilpan, Zimapan, &c. In 1840 he again visited Mexico for the Russian Government with the same object, returning to Munich in 1843, while his collections were sent to St. Petersburg.

Jean Luis Berlandier, a native of Ghent, proceeded to Mexico about the same date as the last-named traveller, and made considerable collections in the North-eastern States of Tamaulipas, San Luis Potosi, Nuevo Leon, and Coahuila, between 1827 and and 1830; but his largest collections were made at a later date in Texas. He died at Matamoros in 1851. There is a set of his plants in the Kew Herbarium, but from the vagaries in the numbering it is impossible to judge whether it is complete or otherwise.

Christian Julius Wilhelm Schiede, a Doctor of Medicine, was accompanied by Ferdinand Deppe in an expedition to Mexico in 1828, the latter having previously visited the country alone. Starting from Vera Cruz they explored all the neighbourhood of Jalapa, ascended Orizaba, and in the cold season visited Papantla and Misantla, making large collections of plants &c. There is a small set of their plants in the Kew Herbarium, labelled, we believe, in Schiede's handwriting; but the first set is at Berlin. Schlechtendal, who, in conjunction with Chamisso, described a large number of the plants in the fifth and succeeding volumes of the 'Linnæa,' also possessed a good set at Halle. Schiede himself contributed to the same serial (vols. iv. and v.) a number of interesting letters on the general aspects of the vegetation of the parts visited.

Hegewisch and Muehlenpfordt, two Germans, collected at about the same time, and some of their plants were described by Chamisso and Schlechtendal with Schiede and Deppe's. Dr. Schiede settled in Mexico, where he practised medicine up till his death from typhus in 1836.

The Voyage of H.M.S. 'Blossom.'—This expedition, under the command of Captain F. W. Beechey, touched at San Blas in December 1827, and remained until the following February; and Mr. Lay, the naturalist, spent a long time at Tepic, about fifty-four miles inland, where he made a collection of dried plants, containing most of the new species described by Hooker and Arnott in their 'Botany' of the voyage, throughout which Jalisco is misprinted Talisco. Later they proceeded to Mazatlan and Acapulco, where, however, they staid only a very short time. Mr. Collie and other officers of the ship assisted in collecting, and in our Enumeration sometimes the names Lay and Collie are coupled; but more frequently the plants of this expedition are assigned to Beechey, in consequence of their having been so labelled in the Hookerian herbarium. The Kew set is not quite complete.

George Ure Skinner.—This gentleman first went to Guatemala in 1831, and he speedily gave a new zest and impetus to the cultivation of orchids in England by the introduction of living plants of a large number of very showy kinds. He was the second son of the Very Rev. John Skinner, Dean of Dunkeld and Dunblane, and was born in 1804*. Skinner's energies, outside of his business, were mainly devoted to orchids, especially to the exportation of living plants to England, but he did not neglect other subjects, having been the first to send many of the peculiar Guatemalan birds to this country. He also greatly aided naturalists who visited Guatemala during his long, though often interrupted, residence in the country. There is a small general collection of dried plants collected by him in the Kew Herbarium; it is probable, however, that this is not the first set, which may be in the Lindley herbarium at Cambridge; still, he concerned himself more with living than dried plants. It is estimated that he introduced living plants of nearly one hundred species of orchids—a great achievement in those early days of plant-importation. A large proportion of them was previously unknown to science. It would be out of place to enumerate here the many gorgeous species Skinner discovered, but it may be mentioned that he was the first to introduce a living plant of an *Odontoglossum* into England. In 1866 he decided to retire from business, and started for Guatemala, with the intention of winding up his affairs. But at Panama, on his outward journey, he was smitten with yellow fever and died.

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* Gardener's Chronicle, 1867, p. 180.

Had he been spared to carry out his plan of settling down in England he would have crossed the Atlantic forty times! Many of Skinner's discoveries adorn Bateman's gigantic book on the orchids of Mexico and Guatemala.

Thomas Coulter.—Dr. Coulter collected in California from 1831 to 1833, and then in Sonora, and was the first from whom we have specimens of the botany of North-western Mexico. He also collected largely in Zimapan and Real del Monte, where he was Surgeon to one of the Mining Companies; but this appears to have been previous to his visit to California. His collection went to Trinity College, Dublin, where Coulter preceded Dr. Harvey as Curator of the herbarium. After Coulter's death in 1843, Harvey distributed the duplicates of the collections, and the first set is at Kew.

G. Andrieux.—An excellent collector of Mexican plants, concerning whom we have been able to find no particulars beyond the fact that he sent dried plants, collected in the States of Oaxaca, Puebla, and Mexico, to Delessert before 1835. The Hookerian herbarium contained a set of Andrieux's plants; but Gay's herbarium, purchased by Sir Joseph Hooker, included a much fuller set, inscribed "Dedit Andrieux, 1834." The plants appear to have been very carefully sorted and numbered, hence it was not difficult to determine those that had been described by DeCandolle and others.

Henri Galeotti; August Ghiesbreght; Jurgensen; Jean Jules Linden; Nicolas Funck.—From 1835 to 1840 Mexico was the scene of great activity among botanical and horticultural collectors. The names we have grouped here belong to Belgians, or to collectors sent out under Belgian auspices; and they collected more or less in company during some portion of their sojourn in Mexico. Galeotti was a native of Versailles, where he was born in 1814; and in 1835 he left Hamburg for Mexico under the patronage of a Mr. Vandermalen. He spent five years there, collecting chiefly in the States of Vera Cruz, Mexico, and Oaxaca; and his collection of dried plants was estimated at 7000 to 8000 species *. With the assistance of various botanists, chiefly of Martens of Louvain, a large portion of the collection was elaborated, though not in all cases very critically. Starting from Vera Cruz, Galeotti first visited Jalapa, and during a stay of six months was able to collect many living plants, especially orchids. He next explored the plains of Perote to Puebla as far as the base of the volcanic chain of Iztacihuatl; he also botanized in the plain of Mexico three several times, and in 1836, accompanied by Mr. Ch. Ehrenberg, of Berlin, travelled for two or three months among the mountains of Real del Monte. Later he visited the Western Cordillera of Mexico, Guadalaxara, and Lake Chapala, and made a rapid journey to San Blas on the shores of the Pacific. In 1837 he went to Guanajuato and the Volcan de Popocatepetl, bringing thence a collection of plants from the highest limits of vegetation. He also ascended to the summit of Campanario, Nevada of Toledo, 15,000 feet altitude, and explored Michoacan, Jesus del Monte, Santa Maria, Patzcuaro, Jorullo, and Uruapan, as far as Guadalaxara. In December of the same year he went north to San Luis Potosi, and on his return visited Mirador and Zacuapan. Accompanied by his friends Funck, Ghiesbreght, and Linden, he next ascended the peak of Orizaba, living for eleven days in a cavern, situated at about 11,000 feet, whence they collected between three and four hundred species of plants at elevations between 9000 and 12,000 feet. In 1839 he went to Tehuacan, Oaxaca, the Cerro de San Felipe, &c., in the Eastern Cordillera of Oaxaca and Chinantla, and on his return explored the Misteca Alta, Peñoles, Ialtepec, &c., leaving Mexico in 1840; and on his return he was rewarded for his services to science by being made a member of the Académie Royale of Brussels. Jurgensen collected for Galeotti after the latter returned to Brussels and established himself as a nurseryman. Nearly the whole of his plants in the Kew Herbarium are uniformly labelled "Talea, Sierra San Pedro Nolasco," &c. Ghiesbreght travelled with Linden and Funck in Mexico from 1837 to 1839, when he came home, returning alone to Mexico in 1840 for the purpose of more thoroughly exploring the country. He visited both the southern and northern States; crossed the great chain of the Cordilleras from ocean to ocean three times; traversed the vast plateaus, and ascended the volcanos of Colima, Jorullo, and Sempoaltepec. Ghiesbreght subsequently made considerable collections in Chiapas. Linden first went to Yucatan, and thence to the States of Chiapas and Tabasco; visiting and exploring the districts of Ciudad Real, Cacaté, San Bartolo Jitotoli, Santiago de Tabasco, Teapa, Puyapatengo, &c., where he formed by far the largest collections we have seen from those parts of Mexico. Linden afterwards became the possessor of the famous nurseries at Ghent previously held by Verschaffelt, and is, we believe, the only survivor of that band of collectors, to say nothing of numerous others of later date, who so largely added to our knowledge of the botany of Mexico. As our Enumeration testifies, Kew possesses very full sets of all except Funck's collections.

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* Botanische Zeitung, 1858, p. 119.

About the year 1836 Don Joaquin Velasquez, who was attached to the Mexican Legation at Rome, came to Europe, bringing with him seeds and dried specimens of various Guatemalan plants, which formed the basis of Bertoloni's 'Florula Guatemalensis.'

Theodor Hartweg; G. J. Graham.—Hartweg collected in Mexico during the same period as Galeotti and his companions, having been sent out by the Horticultural Society of London in 1836, though it does not appear that he fell in with them. The principal object of his journey was to collect and transmit living specimens or seeds of ornamental plants and trees; but he also made large collections of dried plants, the numerous novelties of which were published by the late Mr. George Bentham between 1839 and 1842, under the title of 'Plantæ Hartwegianæ.' Hartweg landed at Vera Cruz in 1836, and proceeded thence to Santa Fé and Zacuapan, which is situated at an elevation of about 3000 feet, and, where, he states *, he encountered the richest vegetation he ever saw in Mexico. His sketch of the flora of the various regions he passed through agrees in its main features with that of Richard and Galeotti, which we elsewhere reproduce in a condensed form, varying only in its details, and being altogether very interesting reading. Hartweg's destination was Guanajuato, whither he journeyed by way of Jalapa and Mexico. His first excursion was to El Gigante, the highest point in the mountains of Guanajuato, where the vegetation is of a cold temperate type, such genera as *Garrya*, *Arctostaphylos*, *Berberis*, *Ribes*, *Arbutus*, and *Quercus* abounding, but *Pinus* was nowhere to be found. The next places visited were Leon and Lagos in Guadalajara, where the country was parched and barren at that season, June and July; accordingly Hartweg proceeded northward to Aguas Calientes, and thence westward to Bolaños, where the vegetation is quite of the North-Mexican character; Bromeliaceæ, Cactaceæ, various species of *Agave* and kindred plants predominate, and above them Oaks and Pines, *Arbutus*, &c. Zacatecas, San Luis Potosi, Los Gallitos, were next successively visited, and the first place a second time; whence the journey was continued to Guadalajara and back to Bolaños. This region proving almost fruitless for his purposes, Hartweg went direct to Morelia, the capital of Michoacan, a country of epiphytes and showy herbaceous plants. After two months' stay in this interesting country Hartweg went to Anganguia, Real del Monte, the Barranca Grande of Mextitlan, from its chalky soil "a favourite haunt for Cactaceæ," *Cereus senilis* attaining a height of twenty-four feet, and northward to the barren pine-hills of Zimapan. It was now the beginning of 1839, and he received instructions to go on to Guatemala. To this end he went to Mexico, and there made the necessary arrangements for an overland journey thither, travelling by way of Oaxaca, Las Cruces, Llano Verde, Comaltepec, Totontepec, and returning to Oaxaca, whence an excursion was made to Chinantla; subsequently journeying direct to Guatemala through Comitan, Huehuetenango, Quezaltenango, Retalhuleu, Totonicapam, and Mixco to the city of Guatemala. Hartweg here met with Skinner, who accompanied him on several of his excursions in search of orchids. The Volcan de Agua was climbed, and a considerable number of plants collected; but it was reserved for Salvin and Godman to more fully explore this peak botanically, as well as the neighbouring Volcan de Fuego. After making a few other short excursions in Guatemala, Hartweg proceeded beyond our limits to the equatorial Andes.

In connexion with Hartweg's collections it should be mentioned that in the earlier part of our Enumeration some of the species are recorded from two places, owing to their having been incorrectly localized in the Hookerian herbarium. The first and fullest set at Kew formed part of the Benthamian herbarium, and the localities given with these may be taken as correct. Respecting the Mexican plants attributed to

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* Transactions of the Horticultural Society of London, 2nd series, iii. p. 115.

Graham, Bentham has the following note*:—"To these plants [*i. e.* Hartweg's] I have occasionally added notes on another most valuable set of above 400 beautifully dried Mexican species gathered about the town of Mexico and in the mining districts of Tlalpuxahua and Real del Monte, and presented to me some years since by G. J. Graham, a gentleman whose name must be well known to horticulturists from the number of handsome Mexican plants he was the means of introducing into this country, and whose zeal in collecting specimens, and liberality in disposing of them, equally entitle him to the gratitude of botanists."

Karl Ehrenberg.—A collector and botanist who spent ten years in Mexico† in the States of Oaxaca, Mexico, San Luis Potosi, &c., and paid special attention to the Cactaceæ, of which he introduced large numbers into European gardens. He contributed some interesting information on the local distribution of this order in the publication cited, the substance of which is reproduced in our remarks on the general distribution of the Cactaceæ. The exact dates of his sojourn in Mexico we have not ascertained, but he accompanied Galeotti on his excursions in the mountains of Real del Monte.

The Voyage of H.M.S. 'Sulphur.'—This expedition, accomplished during the years 1836 to 1842, was mainly for the purpose of surveying the western coast of America, the operations extending from Peru northward to Alaska, but they were chiefly confined to the Californian and Mexican region. A few of the Pacific Islands and New Guinea were also visited. It was commanded by Captain Sir Edward Belcher; and the botany of the voyage was edited by Richard Brinsley Hinds, Surgeon R.N., the botanical descriptions being written by G. Bentham. Collections of dried plants were made at Panama, the island of Taboga, the Gulf of Nicoya, Costa Rica, at Realejo in Nicaragua, in the Gulf of Fonseca, Honduras, and in the neighbourhood of San Blas and Tepic in the State of Jalisco, Mexico; but as the collectors nowhere penetrated far inland, the novelties from these regions were comparatively few and of an uninteresting character. Mr. Hinds and Dr. Sinclair, officers of the ship, and George Barclay, a gardener from Kew, made the collections, and the plants are in the Kew Herbarium.

About this period John Parkinson, F.R.S., was British Consul-General in Mexico, and exerted himself much in the cause of botany, both in making dried collections and in sending living plants to this country. His dried plants are preserved at Kew. The sixty-sixth volume of the 'Botanical Magazine' (1840) was dedicated to him by Sir William J. Hooker, in recognition of his services in advancing botany and horticulture. In 1839 Emanuel Friedrichsthal "performed journeys through a great part of Nicaragua and Costa Rica;"‡ yet all the plants of his collecting in the Kew

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* Plantæ Hartwegianæ, Preface, p. iv.

† Linnæa, xix. p. 337.

‡ Hooker's London Journal of Botany, v. p. 46.

Herbarium are labelled Guatemala. We believe the first set of his collections is at Vienna. Friedrich Ernst Leibold undertook a journey to Mexico, Cuba, and Arkansas in 1839 *; and some of his plants were described by Reichenbach, Kunze, and Schlechtendal †. He died at Havana in 1864, when on his way for the scientific exploration of Yucatan.

Frederik Michael Liebmann.—One of the most active and productive botanists who have collected in Mexico, as a reference to our Bibliography at the end will show. He was born at Elsinore in 1813, and was educated at the College there, and afterwards at Copenhagen. In 1840, with the help of a grant from the King of Denmark, he undertook a journey into Mexico to make botanical and other scientific collections, a gardener (Rathsack) being sent with him to assist him. Landing at Vera Cruz, he started with Baron Karwinsky for the interior, and visited Colipa, Misantla, and Xicaltepec, and then, separating from Karwinsky, went on to Papantla and Tuzutlan. He made Mirador his headquarters during his stay in Mexico, and undertook several expeditions from there: the first being the ascent of the peak of Orizaba with Ghiesbreght and others. The results of this expedition not only added largely to Liebmann's collection of plants, but also determined more exactly the limits of the different regions of vegetation. At the end of 1841 he made an expedition by Huatusco, Cosmomatepec, and Tomatlan to the town of Orizaba, travelling west to Aculzingo and south to Chapulco and Tehuacan de las Granadas. About this time Rathsack was sent home with forty-four cases of living plants and seven of dried ones. From Tehuacan Liebmann visited the desolate country round Tecomavaca, Tiutitlan, Cuicatlan, and Domingilla, and from thence the oak-forests of the Cuesta de San Juan del Estado, the valley of Oaxaca, and the ruined Palace of Mitla were visited. He also ascended the celebrated Mount Sempoaltepec, the vegetation of which differs widely from that of Orizaba, and made excursions into the little-known mountainous region of Chinantla and Pelado to the silver-mines at Yavesia. He next crossed the Cordilleras to Pochutla, whence the excessive drought drove him to Guatulco. From here he travelled along the coast to Tehuantepec, thence returned to Oaxaca, and finally reached Mirador in January 1843. He returned to Copenhagen in June, bringing with him a herbarium of 40,000 plants and considerable zoological collections. He was made Professor of Botany in 1845, and Director of the Botanic Gardens in 1849. We are largely indebted to him for the information contained in the following pages. Alone and in conjunction with other botanists he published many of his plants, but, dying at the comparatively early age of forty-three, many of the natural orders were left untouched, and one of his most important works ‡ was unfinished. This was afterwards completed by

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* Botanische Zeitung, 1864, p. 328.

† Linnæa, xviii. p. 302.

‡ Chênes de l'Amérique Tropicale.

Œrsted; and the foregoing particulars were extracted from a biographical sketch in the work in question. Judging from the broken set of Liebmann's plants at Kew, it would appear that the duplicates were distributed of such orders only as had been elaborated.

John Potts.—This gentleman was manager of the mint at Chihuahua, and, in conjunction with his brother Frederick, who lived on the borders of the State of Sonora, he sent numerous plants, chiefly Cactaceæ, to Mr. F. Scheer, of Kew, between 1842 and 1850 *. In 1845 Carl Heller accompanied Hartweg out, when the latter was on his journey to California, and spent three years and a half collecting in Mexico for the Horticultural Society of Vienna †, and subsequently wrote an interesting and instructive narrative of his travels containing many observations on the vegetation, with a special chapter on the economic plants of Mexico ‡. He travelled and collected in Yucatan, Chiapas, and Tabasco; but we have seen no part of his collections. A portion was published by Peyritsch §.

About the same period Dr. Alwin Aschenborn collected in Mexico, and his plants were described by Nees von Esenbach and Schauer ||, together with others collected by Ruhland and De Berghes.

Anders Sandöe Œrsted.—For almost all that we know of the botany of Costa Rica we are indebted to this botanist, who spent three years (1846–48) exploring that country and Nicaragua, chiefly the great volcanic chain which includes the peaks of Irazu, Barba, and El Viejo. He was afterwards appointed Professor of Botany in the University of Copenhagen, succeeding Liebmann, whose great work on the oaks of tropical America he completed and edited. Œrsted was a prolific writer on Natural History, but, as in the case of Liebmann, only portions of his collections have been published and the duplicates distributed; hence the almost total blanks under many natural orders observable in the general distribution-table in the next section but one of this Appendix. His sketches of the vegetation of the various peaks of Costa Rica are reproduced a few pages further on. He died in 1872, at the age of fifty-seven ¶.

Julius von Warscewicz.—The principal objects of Warscewicz's extensive travels in tropical America were humming-birds and orchids, the latter chiefly in a living state; yet he also made a general collection, though we have seen none of his plants. In

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* Seemann, Botany of the Voyage of the 'Herald,' p. 285.

† Carl Heller, 'Reisen in Mexico,' p. 4.

‡ "Versuch einer systematischen Aufzählung der in Mexico einheimischen, unter dem Volke gebräuchlichen und cultivirten Nutzpflanzen," *op. cit.* pp. 395–432.

§ "Beiträge zur Flora Mexicos," Linnæa, xxx. pp. 1–82.

|| Linnæa, xix. p. 681, and xx. p. 697.

¶ "A Biographical Sketch of the late Professor Œrsted," by R. Brown (Transactions of the Botanical Society of Edinburgh, xi. 1872–73).

1846 he first went to Guatemala, and thence to Salvador, Nicaragua, Costa Rica, Veraguas, and Panama, and on this journey made the acquaintance of Skinner and Œrsted, from whom he received valuable aid. He discovered many new orchids, especially of the showier class, and they are included in our Enumeration. For further particulars we must refer the reader elsewhere *.

American Collectors during the war between the United States and Mexico in 1846 *to* 1848.—Major Eaton and Dr. Edwards of the United States Army collected jointly in Nuevo Leon; and Dr. Josiah Gregg, author of the 'Commerce of the Prairies,' more extensively in the same State, in Coahuila, and southwards to Mexico city. There are sets of these collections at Kew. But the most important of the early collections from North-eastern Mexico is that made by Dr. A. Wislizenus in 1846 and 1847, and in part elaborated by Dr. G. Engelmann †. Most of the novelties described belong to the Coniferæ (*Pinus*) and the Cactaceæ. Only a very small set of these plants is in the Kew Herbarium.

The Botanists and Collectors of the United States and Mexican Boundary Survey.—Our esteemed acquaintance Dr. C. C. Parry, who has so recently, in conjunction with Dr. Palmer, made valuable contributions to the flora of North Mexico, was the leader of the botanical party of the Survey Commission, which commenced operations in 1849. Dr. Parry, a native of Warwickshire, England, went to the United States when quite a young man, and soon found congenial employment. Associated with him, or at least taking part in the same work in connexion with the survey, were Dr. J. M. Bigelow, Arthur Scott, George Thurber, Charles Wright ‡, and others. The collections made by the last-named were by far the most extensive, and were first published separately by Dr. Asa Gray, and afterwards incorporated by Dr. J. Torrey in his general report on the botany of the expedition. Dr. Parry himself contributed the "Introduction" to Dr. Torrey's Report, in which he deals with the physiognomies of the vegetation, the geographical distribution of the plants, and the agricultural capacities of the various districts. His observations on the physiognomical peculiarities of the vegetation of the different regions are specially interesting. The bulk of the botanical collections was made north of our boundary, though a good many incursions were made into Mexico, and perhaps more plants were found within our limits than we have been able to record as such, in consequence of the Kew set not being localized. For reasons set forth elsewhere, we have adopted the Gila and the thirty-third parallel of latitude thence to the Rio Grande as our northern boundary, mainly, however, on account of the impossibility of deciding whether certain plants of this expedition were gathered north or south of the present boundary between the United States and Mexico.

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* Bonplandia, 1854, p. 95.

† Sketch of the Botany of Dr. A. Wislizenus's Expedition from Missouri to Santa Fé, Chihuahua, Parras, Saltillo, Monterey, and Matamoros, 1848.

‡ S. Watson, 'Botany of California,' ii. Appendix, p. 556.

The Voyage of H.M.S. 'Herald.'—Under the command of Captain Henry Kellett, this was accomplished during the years 1845 to 1851. Dr. Berthold Seemann, a native of Hanover *, was appointed naturalist to the expedition, on the recommendation of Sir William Hooker, in succession to Thomas Edmonston, who was killed in Ecuador by the accidental discharge of a rifle; and he joined the ship at Panama in January 1847. Seemann proved an industrious collector, a careful observer, and a fluent writer in a language that was not his own. The countries within our limits explored by him were Panama, including Veraguas, and North-western Mexico. As we reproduce his sketches of the general features of the vegetation of these regions in another place, it is unnecessary to enter into further particulars here. Suffice it to say, that he is our sole authority for Sinaloa, Durango, and other parts of North-western Mexico visited by him. After writing the botany of this expedition, Seemann proceeded, in 1860, on a mission of botanical exploration to the Fiji Islands, the results of which he likewise published, though at considerable loss to himself. Subsequently he visited Panama and Nicaragua several times in connexion with various commercial enterprises, and although very fully occupied with business, he contrived to work a little at botany, hoping to return to scientific research at a future period; but he fell a victim to fever in Nicaragua in October 1871 at the age of forty-six. The first set of the Panama and Mexican collections is at Kew, where Seemann, assisted by Sir Joseph Hooker and Mr. A. A. Black, then Curator of the Herbarium, elaborated his "Botany of the Voyage of the 'Herald,'" and not at the British Museum, if that is what is intended by "study-set" in a statement published in the 'Journal of Botany' †, where we are somewhat severely admonished for not going there to consult this and other collections. But this matter has already been explained in our Preface.

With regard to the localities cited in our Enumeration for Seemann's plants, they are mostly taken from the labels accompanying the specimens in the Kew Herbarium, and unfortunately rarely quite accord with those given by Seemann himself in the Botany of the 'Herald.' As Radlkofer has pointed out ‡, these discrepancies are often serious and perplexing; and we find, in consequence, that we have omitted some species recorded from Panama in Seemann's book and included others which appear to have been collected further south.

Ralph Tate, now Professor of Geology at Melbourne, made a small collection of plants at Chontales, Nicaragua, at about the same date as Seemann, and perhaps in company with him, for the numbers are often, if not always, the same in the two collections. It may also be mentioned here that Hugh Cuming, the well-known and extensive collector of objects of natural history, collected in Taboga I. and in the Pearl Islands, Panama, and Montijo Bay, Chiriqui river, about 1829, and there is a set of his plants in the Kew Herbarium; but it is impossible to distinguish in many cases which were collected within our limits, because they are labelled "Panama et Colombia occidentalis"[*]. Placide Duchassaing de Fontbressin, born at Guadalupe in the West Indies[†], collected at Panama about 1850, and the novelties were described by Walpers and Grisebach[‡], but we have seen none of his plants. Thomas Briggs, a son-in-law of Hugh Cuming, visited Veraguas and Costa Rica in 1856, and there are a few plants in the Kew Herbarium collected by him in the former country. Dr. J. F. Billberg collected at Portobello in 1826; and P. J. Beurling published an Enumeration of the plants[§]. Many are described as new; but those investigated (the Melastomaceæ, for example, by Dr. J. Triana) prove to belong, almost all of them, to previously described species.

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* Journal of Botany (Trimen's), 1872, p. 1; Biography and portrait.

† J. B. in 'Journal of Botany,' 1880, p. 90.

‡ Monographie der Sapindaceen-Gattung Serjania, p. 55.

Mateo Botteri.—A Dalmatian by birth, who was originally sent to Mexico by the Horticultural Society of London[||] about the year 1850; but the Society's resources failing, he collected on his own account and disposed of his collections through Stevens in London. His collections of plants were very fine and extensive, and there is a full set in the Kew Herbarium, chiefly from the neighbourhood of Orizaba, where he soon settled, and where he died a year or two ago. A small collection of Mexican plants from Professor Sumichrast, of Tehuantepec, presented to Kew by Mr. A. DeCandolle in 1877, bear the same numbers for the same species as Botteri's.

Auguste Fendler began his career as a collector in New Mexico in 1846, and subsequently collected in Venezuela, Panama, Nicaragua, and Trinidad, where he died in 1883[¶]. His Panama collection is dated 1850, and there is a good set at Kew. The Nicaraguan collection was a small one, made near Greytown; it is mentioned somewhere in the writings of the late Professor Grisebach, but we do not remember where. Fendler was an excellent collector. In the Kew Herbarium is a small number of plants labelled "Panama, Dr. Halsted, 1850." There was, as we have been informed by Dr. Asa Gray, a Dr. Halsted who was a surgeon in the United States Army, and who botanized a little in North Mexico, though Dr. Gray doubted his having been in

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[*] Journal of Botany, 1865, p. 325.

[†] Bulletin de la Société Botanique de France, xx. p. 275.

[‡] Flora, 1853, p. 226, and Bonplandia, 1858, p. 2.

[§] Kongl. Vetenskaps-Akademiens Handlingar, 1854, pp. 107–148.

[||] Bonplandia, 1857, p. 72.

[¶] The Gardeners' Chronicle, n. s. xxii. p. 91.

Panama; but Mr. Salvin tells me that Dr. M. B. Halsted had charge of the foreign hospital at Panama probably during the construction of the Railway, and that he met Dr. Halsted, he believes, in 1859, in Guatemala, where he resided at Antigua, and where he died shortly after. William Lobb, collector for Messrs. Veitch of Chelsea, spent some months in the neighbourhood of Panama and Chagres in 1843, but he appears to have dried very few plants.

E. P. Johnson.—A small collection of plants made in Yucatan and Tabasco by the Honourable E. P. Johnson was presented to Kew by Dr. Torrey in 1850, and merits notice here on account of the little we know of the botany of this part.

Frederick Mueller.—An Alsatian who went to Mexico in 1853, at the cost of Mr. Schlumberger of Mulhouse, and collected largely between Vera Cruz and Orizaba. It is supposed that he was murdered and concealed, as he disappeared and was never heard of afterwards. There is a good set of his plants in the Kew Herbarium.

Ludwig Hahn, who lived for nearly twenty years in Mexico as a teacher of music, was a zealous collector of plants and animals, and sent numerous consignments of both to Europe and especially to the Berlin Botanic Garden. Several new species of the curious genus *Wolffia* (Lemnaceæ) are among his most remarkable discoveries. He was attached to the French Scientific Commission with Bourgeau, and died in Mexico in 1873. A small set of his plants is at Kew.

Carl Hoffmann and *Alexander von Frantzius.*—These gentlemen left Europe for Costa Rica in 1853 for the purpose of investigating the natural history and geography of the country *, where they spent several years. Dr. Hoffmann wrote several interesting papers on the vegetation &c. of Costa Rica, notably an account of the ascent of the Volcan de Cartago and the Volcan de Barba, references to which are given in our Bibliography. A very few of his plants are in the Kew Herbarium.

Hermann Wendland, Court Gardener at Herrenhausen, Hanover, went out to Central America towards the end of 1856, and spent eight months in Costa Rica and Nicaragua, chiefly occupied in collecting living plants, among which were many new orchids †. This gentleman is one of the first recognized authorities on Palms.

Wilhelm Schaffner.—A pharmaceutical chemist, native of Darmstadt, who settled in Mexico previous to 1856, in which year the late Sir William Hooker received from him the first collection of dried plants ‡. From time to time further contributions were received from him, the last in 1881, through Dr. Asa Gray, from the neighbourhood of San Luis Potosi, where he resided some time before his death, which occurred two or three years ago. Schaffner was an excellent collector, second to none indeed; moreover he was a good botanist; but in the absence of the indispensable literary aids he was unable to determine whether he had a novelty before him or a previously described species, hence he frequently lost the credit due to a discoverer, which was a source of grief and annoyance to him, particularly as some European botanists ignored the manuscript names he appended to plants that proved to be new. He collected very extensively in the neighbourhood of Mexico, Orizaba, and San Luis Potosi, and most of the leading herbaria in the world have been enriched by his labours. Unfortunately each collection was separately numbered.

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* Bonplandia, 1853, p. 233.

† Botanische Zeitung, 1857, p. 278, and Reichenbach, Beiträge zu einer Orchideenkunde Central-Amerikas, p. 61.

‡ Hooker's Kew Journal of Botany, viii. p. 283.

L. C. Ervendberg made a small collection around Wartenberg, near Tantoyuca, in 1858 and 1859, and this is the subject of a special article by Dr. Asa Gray *. There is a small set at Kew.

Sutton Hayes.—A native of New York, who studied medicine, and in 1858 was appointed Assistant-Surgeon to an expedition sent by the United States Government to survey a route for emigrants to the Pacific States, the result of which was the construction of a road from El Paso to Fort Yuma, which occupied two years†. During this period Mr. Hayes made good use of the botanical knowledge he acquired during a two years' sojourn in Paris. Symptoms of pulmonary consumption having for some time declared themselves in his constitution, he visited the Isthmus of Panama for the benefit of his health. Upon his arrival there his condition was so serious that it seemed improbable that he could survive more than a few months, but the change to a warmer climate effected such an improvement that his life was prolonged for more than three years; but he died in the summer of 1863. The tropical vegetation afforded Hayes a rich field of labour and delight, and he explored it with a zeal and perseverance habitual to him, and astonishing to those who knew the infirm state of his health. All that he did for botany was done out of pure love for the subject, and he sustained an enthusiastic interest in it until the last, through all the miseries attending a wasting and painful disease. Kew, especially, benefited by his researches, almost every mail bringing something; and altogether he added largely to Seemann's published enumeration of the plants of Panama, though his additions had not been recorded before they appeared in the present work.

About the same period Dr. Moritz Wagner travelled and collected in Panama and Costa Rica, and he published various articles on the vegetation of these countries, extracts from which we give elsewhere. We have seen none of his plants.

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* Proceedings of the American Academy of Arts and Sciences, v. p. 174.

† Journal of Botany, 1863, p. 254.

Osbert Salvin and Frederick DuCane Godman.—The editors of this work visited Guatemala on several occasions between 1857 and 1874, and gave what time they could spare from their zoological pursuits to botany. They paid special attention to ferns, and made a collection of some 220 species, chiefly in the region of the Volcan de Fuego and the Volcan de Agua. This is by far the fullest set of ferns we have seen from Guatemala, and it contains a considerable number of novelties. Besides the ferns, there are two separate collections of flowering-plants in the Kew Herbarium—one, consisting of about 250 species, dated 1861, and the other, consisting of about 350 species, dated 1873–74, and ascribed to Mr. Salvin alone. These collections, although small, are specially interesting, as they are mostly from considerable elevations on the Volcan de Fuego, and afford nearly all we know of the subalpine vegetation of Guatemala. We are further indebted to Mrs. Salvin for the coloured illustrations, which were selected from a number of admirably executed sketches painted by her in the country itself.

The collectors of the French Scientific Commission to Mexico, 1865–66.—Foremost among these was E. Bourgeau, whose services to botany are familiar to every one engaged in systematic work, and with whom was associated L. Hahn, alluded to in a preceding paragraph. Bourgeau's Mexican collections, like all his previous ones from other parts of the world, are very extensive, and probably more nearly exhaustive of the districts traversed than those of any other collector in Mexico, as they contain the most inconspicuous as well as the showy and prominent plants. He died in 1877, while still engaged in the arrangement of his Mexican plants in the Paris Museum of Natural History [*]. Kew possesses a fine set of them. Independently of the two collectors named, several members of the military staff of the expedition made collections of dried plants [†], notably Dr. Gouin, chief of the military hospital at Vera Cruz, a few of whose plants are at Kew. Then there were Captain Emy, Dr. Weber, Dr. Reboud, and Mr. Thomas, attached to the marching columns, whose names appear as the collectors of various plants described by Fournier. Thiebaut, a naval lieutenant, collected in the vicinity of Acapulco; Virlet d'Aoust in San Luis Potosi; and Guillemin-Tarayre, Goudet, and Franco are other names of collectors of Mexican plants received at Kew from the Paris Herbarium. There is also a small collection at Kew made by Bilimek, who went out as chief gardener to the unfortunate Emperor Maximilian.

Paul Lévy, a French engineer who resided in Nicaragua for some years, collected in the neighbourhood of Segovia, Granada, &c., and wrote some interesting descriptions of the vegetation [‡]. He specially notes, in contrast to the flora of South Mexico, the paucity of species, and the comparative rarity of Bromeliaceæ, Cactaceæ, and epiphytal orchids. The Kew set of his plants was received in 1872.

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[*] L'Illustration Horticole, 1877, p. 72.

[†] Fournier in 'Annales des Sciences Naturelles,' 6^{me} série, ix. p. 262.

[‡] Bulletin de la Société Botanique de France, xvi. pp. 275 et 420.

H. Polakowsky visited Costa Rica in 1875 and collected plants, of which he published a list, together with descriptions of those deemed new [*]. These we have not seen. He also wrote on the general features of the vegetation of the country, and on the cultivated and economic plants [†].

G. Bernoulli.—A Swiss gentleman who took up his residence at Mazatenango, and made botanical collections, chiefly, so far as we have seen, of the tropical and subtropical elements of the flora. Among other things he discovered a remarkable genus of the Sterculiaceæ, which was named after him by Professor Oliver. He also contributed a series of letters on the natural productions &c. of Guatemala to Petermann's 'Geographische Mittheilungen' during the years 1868 to 1875. Since the completion of our Enumeration a further extensive collection of Bernoulli's Guatemalan plants has been received at Kew, and a few of the more important additions to the flora are recorded in the Supplement. Bernoulli died in 1878 at San Francisco.

F. Gaumer.—A zoologist engaged collecting materials for the zoological portion of this work, who has also collected plants in Cozumel and other islands in the Bay of Honduras. These collections are of considerable interest, and they are dealt with in the Supplement.

Recent collections from North Mexico.—In the Introductory Remarks to this part, we have given some particulars of the collections made in San Luis Potosi by Dr. C. C. Parry and Dr. E. Palmer. More recently Dr. Palmer and Mr. C. G. Pringle have extensively botanized the States of Chihuahua and Coahuila, and added many novelties in species and a few genera, though nothing particularly striking, besides extending the areas of many other genera and species. Pringle's last collection reached Kew too late to be incorporated in our Supplement, but partial use has been made of it in the compilation of the tables of geographical distribution.

In concluding this bare outline of the history of botanical discovery in Mexico and Central America, it should be mentioned that we have purposely omitted the names of a large number of persons whose labours in this direction have been of a very limited nature; but they appear in the Enumeration under the plants they respectively introduced alive, or of which they contributed dried specimens.

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[*] Linnæa, xli. p. 545.

[†] Petermann's Geographische Mittheilungen, 1877, pp. 220, 294, & 346.

OUTLINES OF THE GEOGRAPHY AND THE PROMINENT FEATURES OF THE FLORA OF MEXICO AND CENTRAL AMERICA.

UNDER this head it is proposed to give, approximately, the extent and some of the physical conditions of the various areas into which, for convenience, the country has been subdivided in the paragraphs of the Enumeration dealing with the distribution of each species, together with notes on the aspects and composition of the vegetation, extracted from the most trustworthy authorities; but no attempt will be made to deal with meteorological phenomena beyond the barest generalizations. It may be explained here that with the intention constantly in mind, from the commencement of this work, to collect all definite information concerning the extent of virgin vegetation, the predominence of certain genera and species, and such other particulars as would enable one to form something approaching an accurate idea of the physiognomies of the floras of the different latitudinal and altitudinal regions under consideration, the result is far less satisfactory than could have been anticipated. Indeed, so few facts bearing upon the subject exist in collectors' notes on their plants that it has been thought better to quote from the writings of botanical travellers rather than attempt general descriptions or a re-casting of the materials, based upon the available data, especially as this has already been done by Grisebach, Engler, and other authors, who have followed Humboldt. Furthermore, the only boundaries possible in subdividing the whole country are political ones, in consequence of the plants of many collectors not being more particularly localized. In spite of these disadvantages, it will be apparent, we think, that by grouping some of the southern political areas, and dividing the northern one into two, fairly natural limits are obtained, affording data for sound deductions respecting the diverse elements of the flora.

The whole area of land whose vegetation is here dealt with is probably less than 1,000,000 square miles, and lies between 80° and 115° west longitude (the southern part being very narrow, the northern stretching through about eighteen degrees), and 9° and 33° north latitude on the western side, and 26° on the eastern side. An immense coast-line, and a great elevation of the larger part of the country, subjected to widely different climatal influences on the eastern and western sides, are the two prominent features of the country. The southern boundary is practically the railway from Colon to Panama, though a few plants from Portobello and Las Cruces are included; and the Rio Grande to El Paso, and thence across to the Gila and the head of the Gulf of California, the northern boundary. Lower California, however, is not included. Proceeding from north to south, the order followed throughout this work, there are nominally seven districts or divisions, namely: North Mexico, South Mexico, Guatemala, Salvador and Honduras, Nicaragua, Costa Rica, and Panama; but, as more fully explained elsewhere, there are only three distinct floral provinces within our limits.

North Mexico.

It is difficult to determine, even approximately, the area of Mexico; but for the purposes of geographical botany this is of comparatively little importance, for it is notorious how large a proportion of the whole flora of a country is contained within a small space of it. North Mexico, however, is the largest of our seven divisions, having, as here limited, its southern boundary conterminous with the southern boundaries of Sinaloa, Durango, Zacatecas, and San Luis Potosi, extending altogether through about eleven degrees of latitude. Mazatlan, on the western coast, is counted to North Mexico; and Tampico, on the eastern coast, to South Mexico. This arbitrary boundary, as the sequel will demonstrate, coincides, as nearly as any that could be proposed from the available data, with a decided change in the vegetation, the most marked feature of which is the abrupt northern limit of epiphytal phanerogamic vegetation. Indeed, excepting the littoral belt, one might say that purely tropical types do not extend into North Mexico, although a considerable portion of it is situated within the tropics; and this is not wholly due to elevation, but rather to climatal conditions. Much of the country is high tableland, yet there are no lofty peaks such as characterize South Mexico. Tula is at 4000 feet, the town of San Luis Potosi at 6170, Zacatecas at 8000, Durango at 6700, and La Cumbre, in the State of Durango, rises to a height of 10,500 feet, the highest point, we believe, in North Mexico. Every one of the States of North Mexico has been, more or less, botanically explored, and, although much remains to be done, the general character of the flora is very well known. What this is may be gathered from that which immediately follows, the geographical tables, and the paragraphs on the general distribution of the prominent and peculiar natural orders, the essence of which will be summed up and commented upon at the end of this essay. The eastern States have been more thoroughly investigated than the western, yet there is nothing published on the aspects and composition of the vegetation which merits reproducing here. Parry and Palmer and Pringle's recent explorations have added very largely to the number of species, both new ones and others previously known only from north of the Rio Grande; but remarkably few new generic types were discovered. Unfortunately, these gentlemen have hitherto published nothing on the aspects and composition of the vegetation. There is, however, Dr. Parry's sketch of the more striking features of the vegetation of the country on the boundary-line between the United States and Mexico*, from which we glean the following particulars. Incidentally he remarks:—"The observer, a little perplexed by a great variety or gradual blending of forms, involuntarily associates particular localities with the predominating and characteristic vegetable productions. Thus one who has ever traversed the desert tablelands of the Upper Rio Grande will not fail to unite in his recollection of these tracts the dull foliage of the creosote-bush (*Larrea mexicana*), the long thorny wands of the *Fouquieria*, the palm-like *Yucca*, and the crimson-flowered and spine-armed *Cereus*."

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* Introduction to Torrey's Botany of the Survey, forming part of Major Emory's Report.

The flora of the lower maritime districts of the Rio Grande presents no feature of special interest beyond the fact that it is a mixture of tropical and subtropical forms. This is succeeded by rolling prairies underlaid by cretaceous rocks, abounding in trees, including species of oak, hickory, ash, elm, walnut, cypress, &c., with an exceedingly rich undergrowth of vines and other shrubs. The open prairies are densely covered with luxuriant grasses and a rich and varied herbaceous flora. On the southern portion of the Rio Grande, where there is a higher temperature, united with great aridity of soil, a vegetation of quite a different character appears, chiefly the dense "chaparral," consisting of various species of mimosa, acacia, the mesquit (*Prosopis*), and other shrubs, mostly armed with hooked thorns and forming an almost impenetrable jungle. Higher up, where the cretaceous rocks come more to the surface, new forms appear, peculiar to this extensive region. The shrubbery is a continuous succession of the same species, prominent among them *Berberis trifoliata*, *Rhus microphylla*, *Porliera angustifolia*, *Diospyros texana*, *Koeberlinia spinosa*, *Adolphia infesta*, *Microrhamnus ericoides*, and *Celtis pallida* *. Along the margins of the usually dry watercourses the dwarf *Juglans rupestris* and *Fallugia paradoxa* are constantly found. The crevices of the rocky ledges produce various species of *Laphamia* and the scarlet-flowered *Pentstemon grahami*. Several members of the chiefly tropical Malpighiaceæ are characteristic of this region, among them *Galphimia linifolia*, *Aspicarpa hyssopifolia*, and *Janusia gracilis*. Cactaceæ are numerous, especially of the genera *Opuntia*, *Mamillaria*, and *Cereus*, and the curious hygrometric species of *Selaginella* grow on the perpendicular faces of the limestone rocks, together with ferns of the genera *Cheilanthes*, *Pellæa*, and *Notholæna*. A small species of *Agave* with prickly leaves is very abundant and troublesome to the traveller. The tablelands and valleys are usually covered with "grama grass" (*Bouteloua*), with frequent clumps of *Dasylirion*. Various interesting Nyctagineæ, of the genera *Acleisanthes* and *Selinocarpus* &c., are noteworthy; and conspicuous among annuals are several species of *Mentzelia*, *Pectis*, *Hymenatherum*, the pretty *Eucnide lobata*, &c.; but there are so many equally abundant that it is difficult to designate any as characteristic of the cretaceous district. The higher alluvial tracts, forming the basin plains, produce species of more northern types, such as *Œnothera*, *Gaura*, *Riddellia*, and *Polygala*, associated with *Zinnia*, *Peganum mexicanum*, and *Peteria scoparia*. A coarse grass, which presents a uniform dead brown colour throughout the greater part of the year, clothes the depressions in this alluvial region; and the deep recesses and shaded valleys shelter *Quercus emoryi* and

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* Here, as in a few other instances, the name employed by Dr. Parry has not been published, and we have substituted what we believe to be the correct one.

Pinus edulis, with an undergrowth of *Vitis incisa*, *Clematis pitcheri*, *Ungnadia speciosa*, &c. The constant presence of water in the larger valleys is indicated by the growth of poplars and willows.

The vegetation of the valley of the Upper Rio Grande and that of the country immediately adjoining it on either side are strikingly different. Upon the tablelands which spread out beyond the mountain-barrier is a great variety of plants not met with in the more fertile valley, including *Fouquieria splendens*, *Larrea mexicana*, *Flourensia cernua*, *Rhus microphylla*, *Condalia obovata*, *Koeberlinia spinosa*, and various species of *Krameria*, *Ephedra*, *Yucca*, *Opuntia*, *Echinocactus*, *Mamillaria*, and *Cereus*. Of the numerous herbaceous and half-shrubby plants of this region *Cevallia sinuata*, *Greggia camporum*, *Eriogonum abertii*, and several species of *Dalea* may be mentioned. Compositæ are especially abundant, prominent among them *Baileya multiradiata*, *Bahia absinthifolia*, *Porophyllum scoparium*, *Psathyrotes scaposa*, *Hymenatherum acerosum*, *Townsendia strigosa*, *Calycoseris wrightii*, *Stephanomeria minor*, and *Rafinesquia neo-mexicana*. The Nyctagineæ are represented by *Selinocarpus*, *Boerhaavia*, and others; and the principal grasses of the region are of the kinds known as "bunch-grass," and belong to the genus *Bouteloua*. On the margin of the tableland, bordering the valley where it is broken by deep ravines, the sandy bluffs are clothed with chaparral made up chiefly of mesquit (*Prosopis juliflora*) and thorny acacias. *Chilopsis linearis* is frequent in the dry pebbly watercourses; and besides many of the tableland plants already mentioned, there are others which are peculiar to these localities, such as *Dithyrea wislizenii*, *Abronia mellifera*, *Gilia longiflora*, *Lepidium alyssoides*, *Gaillardia pinnatifida*, *Palafoxia hookeriana*, and *Tetraclea coulteri*. In the valley of the Rio Grande dense growths of willows and poplars are frequent. *Prosopis pubescens* often occupies large tracts, with a thick undergrowth of *Baccharis salicina*. In low saline places *Obione canescens* abounds, and *Pluchea borealis* on the higher ground. A number of coarse Compositæ inhabit the valley, such as *Zexmenia encelioides*, *Coreopsis cardaminæfolia*, and *Aster spinosus*, often forming dense matted masses. *Fendleria rupicola*, *Mortonia crassifolia*, *Glossopetalum spinescens*, *Ayenia parvifolia*, *Bouvardia hirtella*, *Tecoma stans*, and *Zexmenia brevifolia* are interesting plants of this region. The higher mountains of the Organ range have a subalpine vegetation and bear a scattered growth of oaks and pines, beneath which flourish a number of herbaceous and shrubby plants similar to those on the loftier ranges westward.

Passing to the Sierra Madre range, *Carpochætes bigelovii*, *Anemone caroliniana*, *Streptanthus linearifolius*, *Pentstemon torreyi*, and *P. fendleri* are characteristic plants of the lower rocky swells. Of shrubby plants various species of *Ephedra* are the most conspicuous. *Fraxinus velutinus* and *Juglans rupestris* border the streams, and *Anemiopsis californica* appears in humid situations. The mountain oaks and pines are chiefly *Quercus emoryi* and *Pinus edulis*, though in certain localities there is larger timber, consisting of *Pinus chihuahuana* and *Pseudotsuga douglasii.* The smaller woody plants here include several Californian species, such as *Cercocarpus parvifolius* and *Arctostaphylos tomentosus.* The vegetation of the upper valleys of San Bernardino, San Pedro, and Santa Cruz contains a large number of endemic types associated with an intermixture of Californian and Texan species. Proceeding to the lower Santa Cruz valley and the desert of Tucson, a distinct botanical district is entered, where again plants characteristic of a dry region are met with. Here *Prosopis* and *Larrea* are conspicuous, and Cactaceæ abound, and include such remarkable forms as the massive *Echinocactus wislizenii* and the lofty *Cereus giganteus.* An *Agave* inhabits the crevices of the neighbouring mountains, where also *Franseria deltoidea*, *Encelia farinosa*, and *Perityle nuda* are found. After the rains the open plains are carpeted with a profusion of brightly-coloured evanescent annuals, among the most conspicuous of which are *Vesicaria* and *Eschscholtzia.*

The flora of the cañons of the Rio Grande differs but little from that of the mountain ravines already alluded to. On the abrupt walls, whether of limestone or of igneous rock, grow *Laphamia dissecta* and *L. bisetosa*, *Perityle aglossa* and *P. parryi*, *Eucnide lobata*, *Cowania ericifolia*, and the monotypic *Emorya.* In open places the characteristic tableland vegetation appears. The flora of the extensive basin of Presidio del Norte is more Mexican in character. Here grow *Kallstrœmia grandiflora*, *Martynia violacea*, *M. arenaria*, *Talinopsis frutescens*, *Nicolettia edwardsii*, and several species of *Boerhaavia.* *Cereus greggii* is common, and the delicious-fruited *C. stramineus* flourishes in its greatest perfection.

Thus far a very much condensed epitome of Dr. Parry's sketch.

For a picture of western and some parts of central North Mexico we cannot do better than reproduce a portion of Seemann's 'Introduction to the Flora of North-western Mexico'*, and a few additional particulars will be found in the quotations from Hartweg's narrative of his journeys in Mexico (see page 126). We give Seemann's own words.

"The district [visited by Seemann] is not defined by any political or natural limits, but by an imaginary line extending from Acapulco north-eastward to Durango, thence to Chihuahua, from that city to the mouth of the river Colorado, in the Gulf of California, and along the western coast of Mexico to Acapulco. Generally speaking, it may be said that a narrow strip of flat land runs along the whole coast, immediately followed by a chain of mountains which on their eastern side join the tableland of Mexico, the plains of Anahuac. Such a district situated partly within the boundary of the tropics, partly without it, and possessing lowlands, high mountains, and elevated plains, has a great diversity of climate—is subject to great extremes of temperature. On the coast from Acapulco to Mazatlan there are the usual tropical seasons, the wet and the dry, the former commencing about the end of May and ending towards the end of August, or sometimes a little later; from Mazatlan northward to the river Colorado, a country situated immediately without the tropics, the equinoctial seasons are less distinctly marked, the climate partaking more of the character of that of the temperate zone, and being besides very dry. In the mountains every altitude has its own range of temperature and moisture; the western declivity, however, possessing generally a higher temperature and a greater degree of moisture than the eastern. On the higher summits the rivulets are frozen during the cold season, and snow often falls.

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* Botany of the Voyage of H.M.S. 'Herald,' pp. 262–265.

"The climate of the tableland of Durango and Chihuahua is like that of the greatest portion of the elevated plains of Mexico, dry, differing in that respect essentially from that of the higher regions of the Colombian, Ecuadorian, and Peruvian Andes, where moisture is abundant, and brooks, rivers, lagoons, and lakes promote a more luxuriant vegetation than is to be met with in Mexico at similar elevations. The extremes of heat and cold are unknown. Towards the end of February the night-frosts cease; spring commences, poplars and willows begin to get green, peaches and apricots put forth their blossoms, but the temperature alone, though fast increasing during April and May, is not sufficient to awaken nature altogether. The fields remain dry, until towards the latter end of May, or in the beginning of June, the vivifying rains set in; in a few days every herb, every shrub, and tree has started into life, and the vegetation develops itself with great rapidity: the season answering to the North-European spring has commenced. Early in September the rains cease; in October the night-frosts (which last until February) recommence, except which there are few indications of winter; snow seldom falls, and never remains long on the ground. The great aridity of the climate is best illustrated by the fact that, although the rainy season only terminates early in September, there is very little water to be met with in any part of the plains during the winter months (October until February). The periodical streams seem to disappear at the moment the rains themselves cease, and the perpetual springs, streams, and small rivers are so few in number that the traveller has very often to search for hours ere he is able to meet with water; fortunately the Mexican flora mostly has furnished a guide to places where there is always a good supply by planting on the banks of the running streams Sabino trees (*Taxodium distichum*), to inform the weary traveller, when he descries their high waving tops, that the object of his search is close at hand.

"The immediate neighbourhood of the coast is generally lined with a dull maritime vegetation, the Mangrove tree being very frequent, and appearing from Acapulco to a little to the north of Mazatlan (lat. 24° 38′ N.), where, together with the Cocoa-nut Palm and many other forms common all along the western shores of America, from Guayaquil northwards, it reaches its extreme northern limit. Advancing a short distance inland, the aspect of the vegetation improves, trees of *Crescentia alata*, *Hæmatoxylon campechianum*, *Cordia gerascanthus*, *Ipomœa arborescens*, *Cratæva tapia*, evergreen Figs, and feathery *Mimosæ*, shrubs of *Bixa orellana*, *Malvaviscus arboreus*, different species of *Hibiscus*, *Triumfetta*, and *Poinsettia pulcherrima*, a great variety of creeping and winding plants such as *Clematis dioica*, numerous Convolvulaceæ, and the splendid *Antigonon leptopus*, which, between Mazatlan and San Sebastian, covers almost every bush with its pink blossoms, are to be met with.

"On ascending the mountains we meet, about 1500 feet above the sea-level, the first evergreen Oaks, which soon increase in number of species as well as in that of individuals, and are, at the height of about 3000 feet, joined by various Coniferæ and a rich mountain vegetation. It is about at this height that the traveller realizes all the ideal notions he may have conceived of fine localities and beautiful vegetation. Santa Lucia, situated on the road from Mazatlan to Durango, may serve as an appropriate illustration. Situated about 4000 feet above the sea, enjoying throughout the year a temperate climate, it lies in a romantic valley encircled by wooded mountains which admit a view of the Pacific Ocean. The houses of the Indians, scattered over an undulated surface, are surrounded by a vegetation in which the graceful forms of the tropics are harmoniously blended with those of the temperate zone. Mimoseæ stand in company with Oaks and Firs, hardy Umbelliferæ and Compositæ with Cupheas, Lobelias, and Lophospermums; nearly every hedge is overgrown by a splendid *Ipomœa*, the azure blossoms of which are from four to five inches across, and set so close together that hardly a leaf is to be seen, and the whole plant resembles a blue sheet, whence it derives its vernacular name, 'Manto de la Virgen' (Cloak of the Holy Virgin).

"At a greater elevation the tropical forms disappear more and more before those usually termed European—Amentaceæ, Coniferæ, Ericaceæ, Gentianeæ, Rosaceæ, &c. Ferns, among them two familiar acquaintances from Europe, *Pteris aquilina* and *Osmunda regalis*, become more abundant, if not in species at least in individuals, especially in the ravines (barrancas), localities which in these as well as in other parts of Mexico are amongst the richest the botanist can explore. Near the Rancho of Guadalupe the author found in one of them, among many other rare plants, a *Lonicera*, a *Hydrangea*, and *Chamæcyparis thurifera*, a noble tree, attaining the height of 100 to 150 feet, and always growing, like the *Taxodium distichum*, by running streams.

"The tableland is in most parts very thinly wooded. For miles and miles you behold nothing save shrubby Opuntias, intermingled with Visachas (*Acacia farnesiana*, Willd.), or groups of Taxate (*Juniperus tetragona*, Schlecht.); indeed, the vicinity of Durango can only boast of about seven species of indigenous trees, namely: a Willow, the Acacia just named, a *Prosopis*, *Cratægus mexicana*, *Taxodium distichum*, *Casimiroa edulis*, and a Yucca. These, together with a few shrubby Acanthaceæ, Compositæ, Scrophularineæ, and Cacteæ, and the everywhere prevailing Agaves, are the chief representatives of the flora one meets with during the winter. Of Cacteæ the immediate neighbourhood offers three *Opuntiæ*, two *Echinocacti*, and a *Mamillaria*."

SOUTH MEXICO.

For reasons already explained in the sketch of North-Mexican vegetation, we can give no definite particulars of the area of South Mexico, except its geographical limits. It lies between about 16° and 23° of latitude, and 87° and 107° of longitude, yet in its widest part, about 20° lat., it extends through only eight degrees of longitude. It is reckoned that three fifths of the whole of Mexico consists of an elevated tableland, 6000 to 8000 feet above the level of the sea, from which rise numerous lofty ridges and peaks. The principal peaks or volcanoes are:—Colima, Jalisco, 12,750 feet*; Cofre de Perote, Vera Cruz, 13,420 feet; Orizaba, Vera Cruz, 17,879 feet; Popocatepetl, Mexico, 17,784 feet; Sempoaltepec, Oaxaca, 13,100 feet; and San Cristobal, Chiapas, 6500 feet. This great mountain-chain is nearly severed in the Isthmus of Tehuantepec.

South Mexico is by far the best explored of our botanical provinces, and parts of it at least, especially the region of Orizaba, vie in richness and variety of vegetation with the most favoured districts of Colombia. From the great differences in elevation of the various States, and the diverse climatal conditions in operation, it is obvious that only by a series of pictures could an adequate idea of the vegetation of the whole country be conveyed. Thus Yucatan, from its lowness, has an almost wholly tropical, though very scanty, vegetation; and from its proximity to the West Indies there is an intermixture of characteristic West-Indian types of vegetation; whilst other States exhibit every type of vegetation from tropical to alpine. Numerous sketches of the vegetation of more or less restricted areas of South Mexico are scattered through a variety of publications in various languages, references to the majority of which are given in the Bibliography at the end of this work; but few of them are sufficiently exact, or complete enough, to be used here. The best and most comprehensive is by Richard and Galeotti, the substance of which is given further on, under the head of "Altitudinal Distribution of Orchids."

Liebmann's description of the successive zones of vegetation from the coast at Vera Cruz to the summit of the peak of Orizaba† is a most interesting and instructive sketch, and we here give an abridged and condensed translation of it.

The most interesting mountain in North America is the volcano of Orizaba. It is only thirty leagues from the coast, from which the ground rises immediately though imperceptibly to its foot, giving it an appearance of even greater height than it possesses. Its cone, crowned with eternal snow, is 17,000 feet high, and can be seen from a distance of 100 miles; it extends north and south in two huge flanks, each of which averages about 9000 feet in height. On journeying from Vera Cruz westward sparse, low, shrubby vegetation, entwined with numerous creepers, is encountered on the hills which lie close to the sea-coast. The grassy plains at Santa Fé, at an altitude of 200 feet, become covered, a mile further on, at Boca del Potrero, with a dense wood, which extends as far as Tolome without any rising of the ground. This wood is composed chiefly of *Mimosa*, *Acacia*, *Bombax*, *Pachira*, *Citrus*, *Acrocomia*, and *Combretum.* The ground, which has hitherto been sandy or marshy, now changes its character, and is succeeded by numerous hills formed of horizontal strata of a hardened marl mixed with sand; over these hills are scattered great blocks of rounded black porphyritic rocks from the distant crater of Orizaba. On this fruitful but almost uncultivated land maize produces 400-fold, and the sugar-cane grows as tall as the best kind in Havana. Thick woods of *Acrocomia aculeata* and the Palma real (*Oreodoxa*) &c. cover the country here.

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* These and other altitudes are mostly taken from Stieler's Hand-Atlas.

† "Vegetation des Piks von Orizaba," Botanische Zeitung, 1844, pp. 668, 684, 699, 717, 734, 750, 767, 781, et 797.

From Paso de Ovejas to Hacienda Mirador, a distance of thirteen leagues, the ground rises imperceptibly in a monotonous stony slope or grass savana, on which grow low thorny species of *Mimosa*, groups of the white *Convolvulus arboreus*, yellow *Bignonia*, and *Cochlospermum.* At an altitude of 3000 feet six or seven species of oak are found, and six species of *Chamædorea*, including climbers as well as standards. Here, in a temperature of 70°, and favoured by the long rainy season of eight or nine months' duration, the richest vegetation of Mexico exists, and orchids reach their maximum with some two hundred species, some terrestrial, but mostly epiphytal. The basaltic porphyry, which extends from this altitude (3000 feet) to the very summit of the volcano, is covered by a strata of hard red clay containing iron, which extends up to above 11,000 feet. From Mirador the country becomes more mountainous; great ridges run north and south, intersected by deep ravines produced by earthquakes, extending west and east, and forming natural watercourses. At San Antonio, Huatusco, and San Bartolomé oaks reach their highest development, not only in the number of species (no less than twenty species being found), but also in their size, which is greater than anywhere else in America; and one group with acorns 8 to 9 inches in circumference is limited to this district. The highest limit of coffee and cotton cultivation is reached at an altitude of between 4000 and 5000 feet; while the sugar-cane, though losing much of its strength and sweetness, is cultivated up to 5500 feet. Associated with the oaks here are Laurineæ, Myrtaceæ, Anacardiaceæ, Malpighiaceæ, and Anonaceæ, with an undergrowth of Melastomaceæ, tree-ferns, *Citrosma*, *Mimosa*, *Acacia*, *Yucca*, reed-like bamboos, *Triumfetta*, *Jatropha*, *Croton*, *Magnolia*, Compositæ, *Symplocos*, the red *Æsculus*, *Aralia*, &c. *Liquidambar styraciflua* has a very distinctly defined vertical area, lying between 3500 and 5500 feet; and *Platanus mexicanus* is still more limited, only growing by running water at 4500 to 5500 feet.

The town of San Juan Coscomatepec, at about 6000 feet, lies at the foot of the Cordilleras; and a league and a half further, at the town of Santa Maria Alpatlahua, the ascent of the volcano begins. This fruitful region has, for 300 years, uninterruptedly produced a rich harvest of maize; and here, too, the juicy aromatic fruit of *Anona cherimolia* reaches great perfection. Sapindaceæ are only represented by *Lacepedea pinnata.* The climate also suits such fruit-trees as the apple, pear, peach, apricot, pomegranate, granadilla, citron, and orange. A *Juglans* grows wild in the ravines near Coscomatepec, and has also been planted in the town itself. *Yucca gloriosa, Cratægus pubescens, Sambucus bipinnata, Clethra tinifolia, Persea gratissima,* and a species of *Cornus* occur most frequently; and *Convolvuli,* brambles, and wild vines take the place occupied by *Smilax, Cissus, Paullinia, Serjania,* Cucurbitaceæ, Apocynaceæ, Asclepiadeæ, Passifloreæ, Bignoniaceæ, and Leguminosæ Scandentes in more tropical regions.

On the eastern slopes of the Cordilleras of Mexico palms reach an altitude of 5000 feet; on the highlands of the interior the genera *Corypha* and *Chamærops* * extend to 8000 feet, while splendid [cultivated] date-palms grow round Tehuacan de las Granadas at 5500 feet, and in the valley of Mexico at 7700 feet. Even the cocoa-nut palm, usually regarded as littoral, succeeds so well on the Hacienda Cocoyota, in the plain of Amilpas, at 3000 feet, that its fruit is considered the best in the market. The vertical limits of tree-ferns are approximately from 2500 to 5000 feet, while figs predominate and grow to a colossal size in the tropical woods of the coast. The numerous arboreous Myrtaceæ are found chiefly between 500 and 1500 feet, though isolated specimens of *Pimenta officinalis,* which is very abundant in the lower forests, occur at 3000 feet, and a few shrubby members of the order were observed at 4800 feet. With regard to the distribution of the Laurineæ, it is impossible to assign them to any definable region, as they extend from the coast to an altitude of 11,000 feet.

From Alpatlahua, which is the highest limit of *Mimosa sensitiva,* to 8000 feet the woods are composed almost entirely of oaks, associated with which are *Lacepedea pinnata, Ulmus mexicana, Clethra tinifolia,* a magnolia-like *Aralia,* and an arboreous *Lippia*; while under these trees grow bushes of *Cornus toluccensis, Viburnum, Triumfetta,* several species of *Rubus,* a yellow climbing Composite, vines, *Cuscuta jalapensis,* and red *Bomarea.* Maize is sown on the open ground, alternating in other seasons with a thick bush of *Cassia,* red *Mimosa, Triumfetta,* with five distinct *Convolvuli* and *Ipomœa* climbing over them. Prominent low-growing plants are species of *Salvia, Dahlia, Phyllanthus, Anoda, Iresine, Hypericum, Lycopodium, Desmodium,* a *Stevia, Euphorbia, Lobelia jalapensis, Lopezia hirsuta, Oxalis,* various species of *Geranium, Cuphea, Thalictrum, Ranunculus,* Melastomaceæ, *Drymaria, Erythræa,* and a number of genera of Gramineæ and Cyperaceæ, as *Vilfa*, *Panicum*, *Paspalum*, *Festuca*, and *Cyperus*. Many parasites and epiphytes grow on the oaks and other trees, among them *Viscum*, *Polypodium*, *Acrostichum*, *Epidendrum*, a species of *Stelis*, *Isochilus*, *Piper*, and *Cereus flagelliformis*, the last being found only on the older trees. The red-spined *Agave* grows wild in the valleys; *Begonia martiana* and a sweet-scented *Oncidium* are found on the steep rocks; and in the clefts a *Sedum*, ferns of the genera *Acrostichum*, *Woodsia*, *Grammitis*, and *Aspidium*, and a species of *Lycopodium*; while at 6500 feet the first *Lupinus* appears. In the tributary streams of the Jamapu river the stones are covered with a green *Ulva*, and a brown club-shaped nostoc. Mosses and lichens are tolerably numerous in this region and include *Anthoceros crispa*, *Gymnostomum*, *Funaria hygrometrica*, *Macromitrium*, *Tortula*, *Hypnum*, *Jungermannia*, *Parmelia*, *Lecidea*, &c.

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* These names were written before the genera of palms had been reduced to their present limits, and Liebmann could not at the time have been acquainted with Martius's 'Historia Palmarum,' for neither *Corypha* nor *Chamærops* is represented in America. What was really intended is a little uncertain, though probably *Brahea* and *Chamædorea.* For many other antiquated or erroneous names we have been able to substitute the correct ones, by referring to Liebmann's collections. On the other hand, several names published by Liebmann without descriptions we have cancelled, though a few may have been overlooked.

After leaving San Salvador Calcuhualco, *Alnus jorullensis*, arboreous and shrubby *Vaccinia*, *Gaultheriæ*, and *Andromedæ* are more frequently seen in the oak-forests mingling with shrubs of *Fuchsia microphylla*; and between 6500 and 7000 feet a more robust *Arbutus* appears, occurring casually up to 10,500 feet. The ugly *Sida carpinifolia* and other species which range from the sea-coast disappear at 6500 feet. Along the wayside grow several species of *Serapias*, a little red terrestrial orchid without tubers, and *Govenia speciosa*, which ascends to 9500 feet. *Neottia aurantiaca* is rare, and limited to a narrow belt below 7000 feet; and the recent destruction of the woods and cultivation in these regions threaten to exterminate it. The showy *Tigridia pavonia* (6600 to 9500 feet), two blue species of *Commelina*, a rosy *Tradescantia*, *Tagetes* spp., *Dracocephalum mexicanum*, *Carduus pyrochrous*, and a yellow *Swertia* grow here, and beneath the bushes *Chimaphila maculata*. The first pine, *Pinus leiophylla*, appears at 6800 feet, though a single isolated specimen was observed at 3000 feet. *Ipomœa purga* is common climbing over the oak trees, and, with *Tilia mexicana*, ranges from 6800 to 8800 feet. In the maize-fields at this altitude grow *Gerardia purpurea*, *Castilleja arvensis*, *Lobelia pauciflora*, a dark red *Allium*, and two *Œnotheræ*, and *Lamourouxia jalapensis* ascends to 9500 feet. Lupins and Coniferæ become more numerous in the still prevailing oak-forests, and various species of *Aster*, *Stellaria*, *Scutellaria*, and *Senecio* give the country a European aspect. At 7800 feet the pine-woods become denser and darker; *Pinus montezumæ* predominating, its branches covered with red *Tillandsia* and *Usnea*. These epiphytes continue up to 10,000 feet, where they are suddenly replaced by *Phoradendron*, which ascends to 13,000 feet. About 8000 feet is the highest limit of arboreous *Solana*; and at this altitude occur *Elymus*, *Gnaphalium*, *Diodia*, *Adiantum capillus-veneris*, and *Cuscuta jalapensis*; 200 feet higher *Cratægus* ceases, while arboreous and shrubby *Buddleiæ* become more numerous. *Bomarea hirtella* twines round the bushes of *Baccharis*; laurels and *Rhamneæ* grow among the oaks and pines, and tree-like Compositæ of the genera *Eupatorium* and *Baccharis* still abound, reaching their highest limit at about 9000 feet. *Lamourouxia multifida* appears between 8000 and 9000 feet; *Smilax* up to 8600; *Clethra tinifolia* and arboreous Araliaceæ up to 8500, and *Monnina jalapensis* up to 9000 feet. At 8800 feet a tree-like grass grows high into the laurel trees; the maize-fields are bordered with *Rubus*, *Salvia*, *Chenopodium ambrosioides*, *Hypericum*, and twining *Sicyos*; and at 9000 feet appears the gigantic *Abies religiosa*, which often attains a height of 200 feet.

The Vaqueria del Jacal, at 10,000 feet, is the highest point of the Eastern Cordilleras, and is surrounded by pine-woods and barley-fields, in which grow *Chrysanthemum segetum*, *Achillea millefolium*, *Plantago mexicana*, *Tagetes clandestina*, several species of *Physalis*, and *Solanum stoloniferum*; and two species of willow, resembling *Salix caprea* and *S. purpurea*, are met with in the pine-woods. Shrubby vegetation is represented by a *Viburnum*, a *Cornus*, a *Litsea*, several *Eupatoria*, *Baccharis jalapensis*, *Gaultheria ciliata*, *Arctostaphylos pungens*, a low *Rubus*, and a *Euphorbia*, while of herbaceous plants there are *Chelone gentianoides*, *Castilleja integrifolia* and *scorzonerifolia*, *Lupinus leptophyllus* and *vaginatus*, a splendid red *Lamourouxia*, *Tigridia pavonia*, *Verbena pulchella*, three species of *Salvia*, two of *Stachys*, *Dahlia variabilis*, a blue *Mentha*, *Ranunculus hookeri*, and *R. llaveanus*, numerous species of *Eupatorium*, *Senecio*, *Stevia*, *Bidens*, and *Potentilla*, a *Phacelia*, *Convallaria*, *Oxalis latifolia*, and *Lopezia hirsuta*, a *Gaura*, *Hypochæris*, terrestrial orchids, such as *Spiranthes*, *Govenia*, *Serapias*, various asters, Irideæ, *Geranium mexicanum*, and several *Gnaphalia*. Other prominent plants are *Alchemilla venusta*, *A. vulcanica*, *A. hirsuta*, and *A. sibbaldiæfolia*, *Veronica serpyllifolia*, *Cnicus jorullensis*, *Verbena caroliniana*, *Acæna elongata*, *Prunella vulgaris*, a *Swertia*, *Pteris aquilina*, *Arenaria decussata*, several *Cerastia*, *Trifolium amabile*, *Hieracium abscissum* and *H. mexicanum*, *Fragaria mexicana*, a *Diodia*, *Pimpinella*, *Chærophyllum*, *Ægopodium*, *Daucus montanus*, a *Melampodium*, a Composite near *Tussilago*, several Urticaceæ, and a *Galium*. Of Gramineæ and Cyperaceæ &c. the genera *Bromus*, *Festuca*, *Deyeuxia*, *Triodia*, *Agrostis*, *Poa*, *Luzula*, and *Carex* are found; while *Hypnum tamariscinum* and *H. delicatulum* carpet the ground as in European pine-woods. On the trees grow an epiphytal *Echeveria*, various species of *Piper* and *Tillandsia*, a *Phoradendron*, a *Polypodium*, *Cornicularia bicolor*, *Evernia*, and *Ramalina*, *Usnea florida*, *Parmeliæ* and *Lecideæ*, *Hypnum*, *Webera*, *Bryum*, and *Tortula*. Along the streams the only Mexican *Calceolaria*, *Mimulus glabratus*, *Epilobium repens*, *Aster rivularis*, a violet, an *Urtica*, *Aspidium filix-mas*, *Sanicula liberta*, *Hydrocotyle mexicana*, *Nasturtium impatiens*, and numerous *Peltigeræ*, *Sticteæ*, &c. On the steep dry cliffs the principal vegetation consists of *Echeveria mucronata* and other species, an *Agave*, a *Sedum*, a *Parietaria*, ferns of the genera *Acrostichum*, *Asplenium*, *Aspidium*, *Notolæna*, *Cheilanthes*, *Polypodium*, and *Adiantum*; two species of *Pinguicula*, an *Arenaria*, like the Alpine *A. setacea*; several low Composites of the genera *Stevia*, *Senecio*, and *Baccharis*, a *Stereocaulon*, a *Bartramia*, and, finally, a species of *Gentiana* and a broad-leaved *Valeriana*.

The richest vegetation exists in the ravines. In the Jamapu Ravine, at 9500 feet, forests of bamboo (*Arundinaria*), twenty-five feet high, were passed, which was the more remarkable as no bamboos had been seen between 3000 and 9500 feet. Round these bamboos twine *Cobœa minor*, while *Bomarea hirtella*, *Fuchsia microphylla*, a *Pleroma*, a *Polemonium*, and a blue *Salvia* cover the ground. Over the cliffs grow a *Solanum*, a *Gronovia*, a *Mimulus*, and a *Lobelia*, and in moist places *Ribes jorullense* and a black-fruited *Rubus*.

Oaks and *Abies religiosa* disappear simultaneously about 300 to 400 feet above the Vaqueria. The range of the pine-woods is from 6500 to 11,000 feet, though isolated and dwarfed trees of *Pinus montezumæ*, together with an alder, occur still higher; the latter ceases entirely at 11,600 feet, but *Pinus montezumæ* not only reaches to 13,600 feet, but even extends on the north-western side to an altitude of 14,000 feet, where it becomes dwarfed, though never shrubby nor prostrate. At the upper limit of the woods, *Spiræa argentea* is the characteristic plant of the country, and ascends to 12,000 feet; *Pedicularis orizabæ*, *Eryngium proteæflorum* and *E. carlinæ*, *Lupinus*, *Veratrum frigidum*, and a *Serapias* are also found in the grass. In these regions low shrubs of *Stevia purpurea* and *arbutifolia*, &c., are specially abundant; yet they do not reach the highest limit, being replaced at higher altitudes by species of *Senecio*, which ascend higher than any other shrubs. A little white *Viola*, *Cerastium vulcanicum* and *C. orithales*, *Arenaria leptophylla*, *Alchemilla*, *Potentilla*, *Lithospermum*, a *Sisyrinchium*, an *Erigeron*, low-growing species of *Stachys*, *Seseli*, and *Œnanthe*, *Tiarella*, *Hieracium*, *Castilleja*, a *Galium*, *Ranunculus geoides*, a *Bidens*, *Nasturtium orizabæ*, *Draba toluccensis*, and *Hypochæris* were observed on the ascent, while by the streams grew *Carex festiva*, a *Barbarea*, *Juncus*, several species of *Luzula*, and a great Araliad. *Bartramia uncinata*, *Pohlia minor*, *Bryum*, *Tortula*, *Didymodon*, *Trichostomum*, *Stereocaulon*, and *Lecidea wahlenbergii* cover the rocks. The zigzag road rises to 13,600 feet, the vegetation becomes scantier, the slopes more sandy and beset with masses of sharp-pointed black and grey rocks; no lava, however, is found. All arboreous vegetation has disappeared at this altitude, and isolated patches of grass are the only prominent vegetation on the sandy plain, which strongly resembles a barren coast.

A large number of plants disappear suddenly on the border of this plain, among them *Lupinus*, *Eryngium* (at 14,000 feet), *Acæna elongata*, *Poa annua*, *Aspidium fragile*, and *Bryum argenteum*; and the whole character of the vegetation changes. The species of grass are for the most part the same as those found by Humboldt and Bonpland on the Nevado de Toluca. The dry sandy ground produces a species of *Conyza*, *Helichrysum lavandulifolium*, various species of *Senecio*, *Gnaphalium*, *Cnicus nivalis*, *Gaultheria ciliata*, *Cerastium*, a *Viola*, and *Draba toluccensis*. In the marshes formed in summer by the melting snow grow a *Ranunculus*, a yellow *Potentilla*, two small species of *Agrostis*, *Carex festiva*, *Luzula*, *Phleum alpinum*, and *Veronica serpyllifolia*. On the rocks appear *Mahonia ilicina* and *Juniperus mexicana*, and a number of Cryptogams including *Andrææ*, *Trichostomum*, *Grimmiæ*, *Thelephora zonaria*, *Parmelia encausta* and *P. centralis*, *Evernia furfuracea*, *Lecidea atroalba* and *L. atrovirens*, and *Umbilicariæ*.

After passing this grassy region, and on reaching the foot of the last cone of the volcano, at 14,300 feet, the ground becomes too steep and difficult even for mules to traverse, and the "Neveros," who carry ice and snow from Orizaba to the coast, are obliged at this point to leave their animals and continue the ascent on foot. Even at this great elevation a varied vegetation exists; thus we find a species of *Phacelia*, a *Castilleja*, *Cnicus nivalis* and another Composite, an *Arenaria*, a *Draba*, a shrubby *Senecio*, most of the grasses of the sandy regions, besides *Evernia ochroleuca*, *Bryum*, *Grimmia*, and *Parmelia centralis*. On climbing the cone an *Avena*, a *Draba*, and here and there single specimens of other grasses and the *Arenaria* are found. Phanerogamia finally disappear at 14,600 feet, probably owing to the nature of the soil rather than to the temperature. Up to 14,800 feet, which is the highest range of vegetation on Orizaba, the rocks are covered with Cryptogams.

Before concluding this part, we may add that little is known of the details of the botany of Yucatan, except that it is very poor and scanty, and largely composed of plants that will bear long droughts without injury. The poverty of the flora is ascribed to the fact that the copious rains rapidly filter away through the porous limestone substratum.

Little is yet known, too, of the flora of British Honduras; but what we have been able to collect may follow here.

British Honduras.

With the exception of a few odd plants introduced from time to time into English gardens, chiefly by different governors of the colony, there were, until recently, no recorded particulars of its vegetation, and exceedingly few dried plants in the Kew Herbarium. Quite recently a collection of forty-four species has been received at Kew from Mr. H. D. M. Hooper; but of course this is insufficient to throw any light on the general character of the flora. There is, however, one more authoritative source of information, from which we extract the leading facts.

Mr. D. Morris (now Assistant-Director at Kew), in a sketch of the history and resources of the colony *, dwells with some detail on its vegetable productions, and gives a very good description of the general composition of its flora. Lying east of Guatemala and south of Yucatan, it has a seaboard about 160 miles long, and its estimated area is 7500 square miles. A considerable portion of the country is low and flat, but it rises in the interior, and in the south the hills extend almost to the coast, rising inland to an altitude of 4000 feet. The most remarkable feature in a rich tropical vegetation is the presence of a pine, extending in places down to the very coast. This pine is apparently of the same species (*Pinus cubensis*) as that occupying similar situations in the Isle of Pines, off the south coast of Cuba, and "is probably the most abundant tree in the colony." It is the predominating tree on the ridges forming the watersheds between the numerous small rivers. In the neighbourhood of Roaring Creek the ordinary pine-ridge plants give place to groves of oak (probably *Quercus virens*); and some of these oaks attain a great size. Between the pine-ridges and the rivers are what are called the Cohune-ridges, in consequence of the predominance of the noble Cohune palm (*Attalea cohune*). The vegetation here is exceedingly rich and varied; but nothing so impresses the traveller, Morris says, as the profusion and diversity of palms, including abundance of *Oreodoxa oleracea* and *Euterpe edulis* *, both West-Indian palms, of which we have no other evidence of their occurring within our limits. Other prominent genera are *Bactris*, *Geonoma*, *Thrinax*, *Sabal*, *Acrocomia*, *Acanthorhiza*, *Desmoncus*, and *Chamædorea*; several of them, like the last, being represented by a number of species. Prominent among orchids are the genera *Oncidium* and *Epidendrum*, but *Gongora*, *Chysis*, *Maxillaria*, *Cycnoches*, *Catasetum*, *Mormodes*, *Coryanthes*, and *Dichæa* are also well represented. The two commonest orchids are *Schomburgkia tibicina* and *Epidendrum bicornutum*, growing in the greatest profusion, even within reach of the salt spray from the sea. Ferns are abundant in the shady depths of the Cohune-ridges, though there appears to be only one species of tree-fern, an *Alsophila*. In conclusion, Mr. Morris, who is well acquainted with tropical vegetation, says:—"It would be impossible to describe satisfactorily the rich profusion and abundance of plant-life as seen in the Central-American forests. Each tree, with its huge branches covered with orchids and bromeliads, and its trunk festooned with climbing aroids and tresses of ferns and club-mosses, is a botanic garden in itself."

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* 'The Colony of British Honduras, its Resources and Prospects, with particular reference to its Indigenous Plants and Economic Products.'

GUATEMALA.

This province exceeds in size any of those south of it, having an approximate area of 60,000 square miles; and the character of the vegetation, if not its details, is almost as well known as that of South Mexico, especially of the Pacific side, where are the highest mountains. The vegetation is so essentially the same as that of South Mexico that it is unnecessary to enter into particulars. Some of the northern genera represented on the Mexican peaks do not appear to reach Guatemala; though this is mere conjecture, as the flora of the uppermost zone of vegetation in Guatemala has been little investigated. For what is known of it we are indebted to Hartweg, and more especially to Salvin and Godman. The alpine element we have examined is almost exclusively from the Volcan de Fuego.

Mr. O. Salvin and Mr. G. C. Champion (who has also spent some years in Guatemala) have put together their joint observations on the vegetation of various districts of Guatemala, which, although wanting in specific details, are highly interesting to the phyto-geographer at home. They follow here:—

"The vegetation of Guatemala is probably as varied as that of Southern Mexico, but there are no large desert tracts as in Northern Mexico. The main mountain-chain is an extension of that of Chiapas, and attains its greatest elevation in the north, where it consists of upland plains such as that of Quezaltenango (7000 feet), Chimaltenango (6000 feet), Guatemala (5000 feet), &c., surrounded by high hills, and the outline broken on the side towards the Pacific Ocean by the volcanoes. These highland plains are, for the most part, comparatively free from the denser growth of trees, and are, where not actually cultivated, covered with grass upon which sheep and cattle graze. The surrounding hills are covered with pines and oaks to an elevation of 10,000 to 11,000 feet.

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* Œrsted's species of this genus (*huj. op.* iii. p. 401) are imperfectly known, and may be the same.

"A dense forest growth covers the slopes of the cordillera towards the Pacific, from an elevation of 5000 or 6000 feet; and this blends with the lowland forests, which are densest and less broken at the foot of the cordillera, but towards the shore of the ocean become more interrupted by forests of palms and other trees and open stretches of rank grass. A long narrow mountain-ridge leaves the cordillera not far from Totonicapam, and at first forms the division between the drainage of the Rio Negro or Chisoy and the Motagua. This ridge again divides—one branch separating the Motagua and Polochic valleys, the other the Polochic and the waters of the Rio Negro and the Rio de la Pasion. The upper part of the valley of the Motagua consists of plains covered chiefly with oaks and pines, the former loaded with orchids and Bromeliaceæ.

"Lower down, the valley contracts, and its sides are covered with scrubby forest mingled with pines, and the upper slopes with oaks, frequently loaded with *Tillandsia* and many orchids (*Pleurothallis*, *Oncidium*, *Epidendrum*, &c.). The hills then recede, and the valley expands into open and comparatively barren plains covered with Mimosæ and Cacti. This vegetation is again succeeded, rather suddenly, between Zacapa and Gualan by rich virgin forests, and these continue to the Atlantic. The valleys of the Polochic and Cahabon rivers take their rise in Alta Vera Paz, in a rainy district covered with dense vegetation, a large portion of which is under cultivation; the ancient forests having, for the most part, given place to second-growth woods, which are cut and burnt from time to time for plantations of Indian corn, coffee, sugar, &c. In these valleys we also find patches of pine-forests occupying the spurs of the chains of mountains bounding and dividing the valleys on either side. In the neighbourhood of Cahabon the vegetation is more scanty, and open grassy plains occur.

"A few leagues above the junction of the Polochic and Cahabon rivers, between Teleman and Panzos, the virgin forest is entered, and this, as in the Motagua valley, continues to the sea, covering the whole country round the lake of Yzabal and the banks of the Rio Dulce.

"The high ridge bounding the valley of the Cahabon river to the north is clothed with virgin forest near its summit, and this forest spreads continuously northwards without any interruption, to the confines of the Department of Peten. Pine-ridges between the rivers, as in British Honduras, intervene, and the vegetation is probably much like that of British Honduras and Yucatan. Between Peten and Alta Vera Paz the forest is perhaps the largest in the whole of Guatemala, and consists of mixed trees of the largest size. It is here that *Theobroma* occurs in a wild state; many Anonaceæ, *Sapota* (?), &c., and palms and ferns in great profusion. Near Peten are forests consisting chiefly of palms and also large tracts of logwood.

"The highest volcano of Guatemala, the Volcan de Fuego, attains an elevation of about 13,100 feet. The summit of the Volcan de Agua is about 12,400 feet above the sea. The latter peak is clothed with grass and a few pines, together with alpine shrubs, *Vacciniæ*, lupins, &c., up to the summit; but the Volcan de Fuego, owing probably to the looseness of the scoriæ, is nearly barren, a little vegetation of ferns, lycopods, &c. only having fixed itself in the crevices of rocks. Lower, on both volcanos, the pine-trees become larger and more numerous, down to an elevation of about 10,200 feet, where they entirely cease very suddenly, and give way to a dense mixed forest, of which the *Cheirostemon* is one of the most characteristic trees. Large evergreen oaks are prevalent at an elevation of about 7000 to 8000 feet; and at about 7000 feet and below the virgin forest has been destroyed, while below this zone Indian-corn patches alternate with second-growth woods; the latter being cut and burnt from time to time and turned into the former, and the maize-fields allowed to run wild and gradually become woods. But the upper forests suffer from the lower clearings, for the fires starting from the newly-felled clearings often spread into the upper forests and even to the pines above; and the destruction caused is immense. These fires often last for days in the dry season, and spread over large tracts of the mountain sides.

"The Volcan de Atitlan somewhat resembles the Agua and Fuego; but the zones of vegetation are not so clearly marked. The coffee-plantations of San Agustin encroach upon the forest up to an elevation of about 3500 feet; above that a very rich tract of forest prevails on the southern slope of the mountain, through a large portion of which is a beautiful undergrowth of small palms. The summit of this mountain is nearly bare, but a few plants are to be found in the crevices of the rocks fostered by steam issuing therefrom.

"The rainy season in Guatemala usually lasts from the middle of May till the middle of October, with an occasional intermission in August. In the more elevated portions of Alta Vera Paz the dry season is of much shorter duration, the rains often lasting till the beginning of March and commencing again at the end of May."

Honduras and Salvador.

The former, it is estimated, contains 40,000 square miles, and the latter about 11,000; yet the total number of species recorded in our Enumeration from the two countries is only 160, and some of these were probably from British Honduras rather than Spanish. Indeed, the only reason for giving these countries a column in the Geographical Tables was to show how little is known concerning their botany. Immense forests exist in

Honduras similar in composition to those of British Honduras, which, it may be added, are very imperfectly known. A great part of the country is low, but the Congrehoy Mountain is a little more than 8000 feet high.

NICARAGUA.

Estimated at 30,000 square miles, and extending through about four degrees of latitude, with one principal ridge of mountains stretching across the country from north-west to south-east, nowhere reaching any great altitude, the greatest being the volcano El Viejo, which rises to a height of about 6250 feet. Œrsted * describes the vegetation of this peak, which is situated near the sea, in the north-western part of the country, as highly remarkable and more diversified than that of Irazu (Costa Rica), which is 5000 feet higher and only about 3° further south. Indeed, he states that it exhibits a greater number of distinct altitudinal zones of vegetation than Irazu. This may be so, yet they can hardly be considered climatal zones. He erroneously fixed the altitude at 5000 feet, and distinguished five zones of vegetation, limited as follows:—1, tropical forests, from 0 to 1500 feet; 2, *Acrocomia* and *Quercus*, from 1500 to 2200 feet, the latter genus only sparingly; 3, grasses, from 2200 to 3000 feet; 4, pines, from 3000 to 4200 feet; 5, ferns and agaves, from 4200 to 5000 feet. It is evident that this division of the vegetation was based on imperfect observation, or rather on a false appreciation of the facts; but we give it for what it is worth, as there is no gainsaying the unusual character of the vegetation of this peak. Œrsted, however, asks, Who would expect to find agaves associated with "alpine" ferns? Yet, as might be imagined, the ferns are not of an alpine character; therefore the question requires no answer. Moreover, agaves ascend much higher in Mexico, and on the peak of Chiriqui *Agave* (or *Furcræa*) is said to be a conspicuous feature in the uppermost zone of vegetation. Incidentally, it may here be mentioned that the genus *Pinus* finds its southern limit in Northern Nicaragua, further particulars of which will be found in the notes on the distribution of the Coniferæ, page 265. As may be gathered from the fact that we have been able to record only about 1000 species of vascular plants inhabiting Nicaragua, the flora is still very imperfectly known; yet it is decidedly doubtful whether it exhibits such richness and variety as are found in Mexico and Costa Rica. Lévy † writes of Nicaragua as a vast forest pierced by roads and broken by clearings for the towns; and the composition of the forest he describes as poor in species, with comparatively little variety in epiphytal orchids and bromeliads, and a great abundance of climbing and twining plants. Belt ‡ states that the vegetation of Nicaragua is divisible into three longitudinal zones, the most easterly being covered by an unbroken forest, the principal products of which are mahogany and india-rubber. The central zone is composed of grassy savanas, on which cattle, mules, and horses are bred; while the western zone, skirting the Pacific, possesses a more diversified vegetation, and is an exceedingly fertile country, where all the cultivated plants of the tropics thrive admirably.

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* Botanische Zeitung.

† Bulletin de la Société Botanique de la France, xvi. pp. 275 et 420.

‡ 'The Naturalist in Nicaragua,' p. 328.

Costa Rica.

This has an area of about 25,000 square miles, or about half that of England; and the mountain-chain, which is broken by the Rio San Juan and the Lake of Nicaragua, again rises much higher than in Nicaragua, culminating in the Volcan de Irazu, which is 11,500 feet high. Costa Rica has been much more fully explored botanically than Nicaragua, chiefly by Œrsted, whose extensive collections have, however, only been partly published and distributed; hence the numerous blanks and low numbers in the Geographical Table some pages further on. Nevertheless we are able to record upwards of 1200 species of vascular plants.

Œrsted ascended and botanized nearly all the volcanos from Chiriqui to El Viejo; and he described those of Costa Rica in his unfinished work 'L'Amérique Centrale,' from which we obtain the following particulars:—

The Volcan de los Votos is situated on the north of the town of Alajuela, and rises to a height of 8000 feet by such a gentle slope that it can be ascended on horseback. Its base is occupied by pasture-land and fields of maize, and the forests only begin at altitudes of 5000 to 6000 feet. They are composed of *Cedrela*, *Myrtaceæ*, *Laurineæ*, *Melastomaceæ*, &c., and in the underwood grow various species of *Chamædorea*, *Ardisia*, such Rubiaceæ as *Psychotria hebeclada* and *Hamelia patens*, and of Compositæ, *Verbesina microcephala.* At about 7000 feet oaks predominate, and a species of *Podocarpus** with narrow leaves was found. The summit of the volcano forms an undulating ridge from two to three miles in width, on the east of which rises a little dome-shaped peak some few hundred feet high. The oaks there are very stunted, and are mingled with a few shrubs such as *Vaccinium consanguineum* and *Comarostaphylis rubescens.* The crater is situated on the north side, about 1000 feet below the summit; and in the centre is a small lake, the water of which contains sulphuric acid, and emits air-bubbles and jets of vapour. Among the volcanic ashes scattered about are found small pieces of native sulphur, which must have been much more abundant there formerly, for the crater was frequently explored by collectors of sulphur. Apparently the volcano is not quite extinct, for in 1834 a considerable eruption, accompanied by subterranean rumblings, took place, and cinders were thrown to a distance of thirty miles. Œrsted visited its southern slopes in May 1847, and Dr. von Frantzius also explored the crater in March 1860. (*Peterm. Mitth.* 1861.)

The Volcan de Barba is separated from Los Votos by the Dezengaño valley, and may be seen from San José, raising its three summits towards the north, the centre peak towering above the other two. Heredia, one of the largest towns of Costa Rica, lies at the foot of the mountain, about 4000 feet above the sea, and the ground rises so abruptly behind it that the little Indian town of Barba, which is only two miles distant, has a much more bracing climate. Even before the arrival of the Spaniards, the country had been cleared and cultivation had been practised up to 6000 or 7000 feet. At this altitude the ground is covered with magnificent forests, consisting chiefly of *Cedrela odorata*, *Eugenia lepidota*, laurels, and oaks; there are also great numbers of shrubs and undershrubs, most of which are new to science, as *Mapouria parviflora*, *Palicourea mexicana*, *P. costaricensis*, *Higginsia psychotriæfolia*, *Montagnæa hibiscifolia*, *Ardisia nigropunctata*, *Glockeria sessilifolia*, *Siphocampylus gutierrezii*, *Berberis paniculata*, *Oreinotinus costaricanus*, and great numbers of Epiphytes, Ferns, Peperomias, and Bromeliads, a proof of the greater dampness of climate here. Above 7000 feet oaks (*Quercus costaricensis* and *Q. granulata*) predominate, though at the summit, about 10,000 feet, they are quite stunted and are interspersed with such Ericaceæ as *Gaultheria œrstediana*. *Gunnera insignis*, one of the most remarkable plants which Œrsted discovered, grows at this altitude. It is the most northern representative of its genus, which is confined chiefly to the Pacific Islands and South America. Œrsted also found a *Calceolaria* here, a genus belonging principally to Peru and Chili. The crater is situated to the south-east of the summit, and is between two and three hundred feet below it. Its sides are clothed with thick bushes of *Psidium costaricense*, *Ugni œrstedii*, *Myrsine rapanea*, a species of *Vaccinium*, *Gunnera insignis*, and several others. At the bottom is a lake, about 200 feet in diameter, its water smelling and tasting of sulphur, and its temperature 52°·25 Fahr. Œrsted visited this volcano in May 1847, and it was explored afterwards by Dr. Hoffmann.

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* This is the only evidence we have of this genus being represented north of the Isthmus of Panama.

The Volcan de Reventado, which is about 9300 feet high, lies to the east of the watershed separating the watercourses. Œrsted was the first to explore and determine its volcanic character. It is separated from the Volcan de Irazu by a very fertile valley called Potrero de los Angelos. The country is covered with maize-fields and pasture-lands, and is watered by the little stream of Reventado, which has its source in the lake of the crater. After crossing this stream the road passes, by a somewhat steep ascent, through the lower region of oaks, and through the most luxuriant and diversified vegetation, to which the rich colours of various species of *Siphocampylus*, *Ardisia*, *Proclesia*, and *Mahonia* give a most attractive appearance. Here were found the remains of a paved road of the period when the Indians were masters of the country. To this succeeds a small plain where the principal vegetation is a species of *Paspalum*, two Cyperaceæ (*Oncostylis nigricans* and *Chætocyperus viviparus*), *Lupinus clarkei*, *Castilleja irasuensis*, and a species of *Alchemilla*. On the western boundary of the plain rises the volcano, a dome-shaped symmetrical mountain, very steep and bare. The southern slope of the volcano begins on a level with the bottom of the extinct crater, for on this side its walls have entirely given way, while towards the north, east, and west they rise abruptly some 500 or 600 feet. No trace of vegetation is to be seen on their upper part. The upper edge of the crater has fallen away in places, leaving very irregular indentations. At the bottom is a small lake about 100 feet in diameter, its banks studded with compact rows of oaks supporting Bromeliads, Columneas, and Usneas. Among other epiphytes growing here is the pretty little *Odontoglossum œrstedii.*

Œrsted describes this crater as one of the most beautiful and romantic spots of Central America. The air is fresh and pure (the thermometer at 3 A.M. being 53°·6 Fahr.), and the flora the most interesting in the neighbourhood of the volcano. It exhibits a remarkable blending of tropical vegetation with more northern types, such as *Hieracium irasuense*, *Alchemilla*, *Viola*, *Geranium*, *Vaccinium*, and others, recalling to the European traveller the memory of his distant fatherland. Among the more conspicuous plants in the neighbourhood of the lake may be mentioned *Senecio œrstedianus*, easily recognized by its ample glossy leaves with a beautiful dark green upper surface, though tomentose and white as snow below. The Reventado river, which has its source in the lake, winds down the whole length of the southern slope, and, after providing the town of Cartago with delicious water as pure as crystal, it falls into the Reventazon.

The Volcan de Cartago, or Irazu, is the highest peak of this part of Central America, and is seen both from the Pacific and the Atlantic, and produces a much more imposing effect from a distance than from the small tableland of Cartago, at the very foot of the volcano, for it rises towards the north by such a gentle slope that its height appears less than it really is, and it would seem almost possible to ride up to its very summit on horseback. All the southern slope, as high as 7000 to 8000 feet, is cultivated or laid out as pasture-land. Here is situated Cot, the highest town of Costa Rica. The banana, the orange, and the coffee-plant at this point disappear before the peach, the quince, and other European fruit-trees, and maize (which reaches its highest limit in this region between 7000 and 7500 feet) is replaced by wheat, peas, and potatoes.

From the southern slope the forests have almost entirely disappeared before cultivation, and only in the valleys do small woods exist. *Eugenia leucadendron*, *E. cartagensis,* several arboreous Composites, and various species of *Rubus*, including *R. irasuensis*, are the principal plants. The region of oaks is next entered; this ranges from between 7000 and 8000 to 10,000 feet, and contains four conspicuous species which are peculiar to Costa Rica, and which were first discovered and brought to Europe by Œrsted: they are *Quercus costaricensis*, *Q. citrifolia*, *Q. granulata*, and another. The underwood is as remarkable as that of the Volcan de Barba for its variety, richness, and beauty. Œrsted had much greater facilities for becoming acquainted with the flora of this district, and but few of the numerous plants which he brought home with him were already known. Some representatives of tropical genera, such as *Artanthe*, *Peperomia*, *Miconia*, and *Clidemia*, grow up to 9000 feet. Among other plants forming the underwood may be mentioned *Proclesia veraguensis*, *Siphocampylus gutierrezii*, *Centropogon costaricanus*, *Ugni œrstedii*, *Hedyosmum callososerratum*, *Oreinotinus stellato-tomentosus*, *Ardisia irasuensis*, *A. lœvis*, *Eupatorium ixiocladon*, *Oreopanax œrstedianum*, and, at the upper limit of the oaks, *Comarostylis rubescens* and *Buddleia alpina*. At 10,000 feet oaks become more and more stunted, and are quite covered with *Usnea*; then all arboreous vegetation suddenly ceases, and alpine plants take its place.

The abrupt and striking contrast between these two levels proceeds from a sudden change in the nature of the ground—the trachyte, covered with vegetable mould, being succeeded by ashes and volcanic sand. In the lowest part of this region the ground is thickly carpeted with *Alchemilla* and *Lupinus*, and the dead white stems of a number of *Comarostylis rubescens* are scattered among them. The ground, as it rises, becomes more and more bare, and, on reaching the large flat crest which forms the summit of the volcano at 11,000 feet, nothing is to be seen but scanty tufts of the woolly-leaved *Gnaphalium lavandulaceum*, lichens, *Castilleja irasuensis*, *Sphacele alpina*, *Vaccinium densiflorum*, *Pernettya coriacea*, and two other species, which form thick bushes six to seven feet high, covered with fruit and flowers, and clothed with *Usnea*, and a leafless yellow *Viscum*. A species of *Hypericum*, resembling *H. brathys*, and having brilliant yellow flowers, is found here often covered with black fungus (*Scorias robinsoni*).

At 9 o'clock A.M. on Jan. 20th the thermometer was 41° in the shade, and each night a thin coating of ice was formed, which melted in the course of the day. From the summit the most splendid view possible is obtained: on the west is seen the Pacific Ocean and the port of Punta Arenas; on the north, where the volcano falls away almost perpendicularly for several thousand feet, lies a vast uninhabited country covered with virgin forests and hitherto unexplored; it stretches from the volcanic chain as far as the river of San Juan de Nicaragua. On the east, beyond the crater, the Volcan de Turrialba, which constantly pours forth smoke and vapour, is visible. On the eastern extremity of the small tableland which forms the summit of Irazu, and 200 to 300 feet lower, rise two craters which, though of very different age, are so closely united that they might be taken for twin craters. The one on the south is much the older, and is partly covered with forest. The other, which is turned to the north, is a completely bare cone of ashes; and at its base are three deep cavities, one of which constantly throws up sulphurous vapours. This, doubtless, is the new crater which, according to native accounts, was formed in 1723.

The Volcan de Turrialba is almost inaccessible, and had never been ascended by any traveller. It lies to the north-east of Irazu, from which it can be seen rising in an irregular cone to almost the same height. The north-east slope is very steep, and several crevasses may be seen, from which smoke and vapour are continually rising.

PANAMA.

Including Chiriqui and Veraguas, this province is estimated to contain 34,000 square miles. The volcano of Chiriqui is 11,265 feet high, or barely 250 feet lower than the highest point in Costa Rica; but at the Isthmus itself the highest point along the line of the railroad between the two oceans is only about 330 feet. Seemann and Sutton-Hayes are the two principal collectors of the 1550 species recorded from this province; and the former wrote a 'Flora Panamensis*, from which we extract those portions of his "Introduction" relating to geographical botany in its widest sense.

"The isthmus is not distinguished for high mountains. The mighty chain of the Andes, after traversing the continent of South America, decreases when approaching this narrow neck of land, and in the province of Panama is hardly recognizable in a ridge of hills seldom exceeding 1000 feet in height. On entering Veraguas the Cordillera attains a greater elevation, and in the volcano of Chiriqui presents the most elevated part of the isthmus, a peak 7000 feet high †. The ridge is covered with forests, and is chiefly confined to the central and northern districts. The coast of the Pacific Ocean, especially in the cantons of Nata, Santiago, and Alanji, abounds in grassy plains or savanas of great extent, which, by affording pasture to numerous herds of cattle, constitute the principal riches of the country. Volcanos, all now extinct, rise in different parts; the highest is the Chiriqui; another about 3000 feet in elevation, called the Janano, is at Cape Corrientes in Darien, and several others are reported to exist in Veraguas; even the island of Taboga has been considered as a portion of a crater. But, though destitute of active volcanos, the isthmus by no means enjoys an immunity from earthquakes. Some rather severe shocks, coming from the west, and having apparently their origin in Central America, are now and then experienced, especially during the dry season; but they do not seem to exercise any baneful influence on the vegetation, as is the case in Peru, where, after severe shocks, corn-fields have been known to wither.

"With the exception of the higher mountains, where the temperature is comparatively low, the climate is hot and rainy. The seasons are distributed into wet and dry. The rains commence with the appearance of the new moon in April, and are, in the beginning, mere passing showers; but they gradually increase, and are fully established towards the end of May, when they fall in torrents, sometimes for days together in succession, and are accompanied by thunder and lightning of the most terrific description. Save a few days about the 24th of June, the Veranito de San Juan, the rains continue for eight months, until the end of December; and in Southern Darien and some parts on the Atlantic side they last almost the whole year. During this time fogs, calms, and light variable winds prevail, and the air is loaded with so much moisture that leather cleaned in the morning is densely covered with mould in the evening. The temperature does not vary more than from 75° to 87° Fahr. Towards the end of December the violent rains diminish in frequency, and with the commencement of the new year the north-west wind sets in. An immediate change follows; the air becomes pure and refreshing, the sky blue and serene, hardly a cloud is to be seen, and, there being but little moisture in the atmosphere, the heat, though ranging between 75° and 94° Fahr., is less felt.

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* Botany of the Voyage of H.M.S. 'Herald,' pp. 62–73.

† This is far wrong, according to later measurements. See preceding paragraph.

"A country so much visited by heavy rains naturally abounds in rivers; the number cannot fall short of two hundred, and during the wet season not a mile of land can be traversed without crossing at least five or six periodical streams. Most of the rivers have deltas, which, in many instances, assume the appearance of islands. Their vegetation is a curious mixture of littoral and inland plants, and often presents species from the higher mountains, to which the remote sources of the water may be traced. Of these rivers emptying themselves into the Pacific Ocean, the San Juan, Churchunque, Bayano, Rio Grande de Nata, Santa Maria, Tavasara, and Chiriqui are the largest; of those flowing into the Atlantic, the Belen, Veraguas, Chagres, and the nine-mouthed Atrato. Nowhere is the vegetation more luxuriant than on the banks of these rivers. Wild fig-trees form great bowers over the bed, evergreen *Pithecolobiums* emit a delicious perfume, bamboos (the most gigantic of grasses) show their feathery tops, groves of vegetable-ivory palms display their foliage; to whatever spot the eye is directed it meets fresh beauties, new charms.

"The aspect of the flora is much more diversified than the uniformity of the climate and the surface of the country would lead one to expect. The sea-coast and those parts influenced by the tides and the immediate evaporation of the sea produce a quite peculiar vegetation, which is generally characterized by a leathery glossy foliage and leaves with entire margins. In all muddy places, down to the verge of the ocean, are impenetrable thickets formed of mangroves, chiefly *Rhizophora* and *Avicennia*, which exhale putrid miasmata and spread sickness over the adjacent districts. Occasionally extensive tracts are covered with the 'guagara de puerco' (*Acrostichum aureum*, Linn.), its fronds being as much as ten feet high. Myriads of mosquitoes and sand-flies fill the air; huge alligators sun themselves on the slimy banks, lying motionless, blinking with their great eyes, and jumping into the water directly any one approaches. To destroy these dreaded swamps is almost impossible; the Avicennias, with their asparagus-like rhizomata, send up innumerable young shoots whenever the main stem is felled; the Rhizophoras extend in all directions their long aërial roots, which soon reach the ground and preserve the trees from falling after the terrestrial roots have lifted them high above the original level. At Panama, where the tide rises to the height of twenty-two feet, these trees are frequently under water, the heavy surf washing their tops, apparently without injuring or checking their growth; indeed, so well has Nature provided for them, that the seed of the *Rhizophora* begins to germinate while the fruit is yet attached to the tree, and it is not until it has sprouted out to the length of some inches that it drops as a young plant into the mud below. Rivers as far as they are subjected to the influence of the ebb and flow are full of mangroves and the highest Rhizophoras, which, growing always on that side where there is the deepest water, assist the natives in conducting their canoes through the mud-banks. On the sand of the sea-beach the *Ipomœa pescapræ* grows in wild luxuriance, producing runners often more than 200 feet long. Higher up, where the ground is firmer, are groves of cocoa-nut palms, poisonous manzanilla trees, and spiny *Prosopis* and *Cereus pitajaya*, or thickets of *Crescentia cucurbitina* and *Paritium tiliaceum.*

"Far different is the vegetation of the savanas. The ground, being level or slightly undulated, is clothed during the greater part of the year with a turf of brilliant green. Groups of trees and bushes rise here and there; silvery streams, herds of cattle and deer, and the isolated huts of the natives tend to give variety to the scene, while the absence of palms and tree-ferns imparts to the whole more the appearance of a European park than a tract of land in Tropical America. The turf is almost as dense as in an English garden, and contains, besides numerous kinds of grasses, many elegant Papilionaceæ, Polygalaceæ, Gentianaceæ, and Violaceæ; the sensitive plant (*Mimosa pudica*) prevails in many localities, shutting up its tender leaves even upon the approach of a heavy footstep. The clumps of trees and shrubs over which *Panax speciosa* and *Cecropia peltata* are waving their large foliage are composed of Myrtaceæ, Melastomaceæ, Chrysobalaneæ, Papilionaceæ, Verbenaceæ, Compositæ, Dilleniaceæ, Anonaceæ, Malpighiaceæ, and Acanthaceæ, and overspread by Convolvulaceæ, Aristolochiaceæ, Apocynaceæ, and other climbing or twining plants. Orchideæ are plentiful in the vicinity of the rivers, where the trees are literally loaded with them. The vanilla climbs in abundance up the stems of young trees, and often increases so much in weight as to cause the downfall of its supporters. The 'chumicales'*, or groves of sand-paper trees (*Curatella americana*), form curious features in the landscape. They extend over whole districts, and their presence indicates a soil impregnated with iron. The trees are about forty feet high, have crooked branches (an approximation to the twining habit of the tribe); and their paper-like leaves, if stirred by the wind, occasion a rattling noise which strongly reminds one of the European autumn, when northerly breezes strip the trees of their foliage.

"Forests cover at least two thirds of the whole territory. The high trees, the dense foliage, and the numerous twining and climbing plants almost shut out the rays of the sun, causing a gloom which is the more insupportable as all other objects are hidden from view. Rain is so frequent, and the moisture so great, that the burning of these forests is impossible; a striking difference to those of the temperate regions, where a fire often consumes extensive woods in a very short space of time. Flowers are scarce in proportion to the mass of leaves with which the places are crowded, and in no respect is the European more disappointed: from cultivating in his gardens none save the choicest and most brilliant flowers which the regions of the sun are capable of producing; from seeing on the stage tropical scenery, which looks more like a representation of fairyland than of sublunar places; and from reading those highly-coloured accounts with which many travellers have endeavoured to embellish their narratives—his imagination has drawn a picture of equinoctial countries which a comparison with nature at once demolishes. The espave (*Anacardium rhinocarpus*) and the corotu (*Enterolobium schomburgkii*) are amongst the most gigantic trees, attaining a height of from 90 to 130 feet, and a circumference of from 24 to 30 feet; and no better estimate can be formed of their size than by an inspection of the port of Panama, where vessels of twelve tons burden, made of a single trunk, are riding at anchor. The forests occasionally consist of only a single species of tree, but generally they are composed of different kinds, the principal forms belonging to Sterculiaceæ, Tiliaceæ, Mimoseæ, Papilionaceæ, Euphorbiaceæ, Anacardiaceæ, Rubiaceæ, Myrtaceæ, and Melastomaceæ; these, and the prevalence of palms, tree-ferns, Scitamineæ, and Aroideæ, stamp on them the real tropical character.

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* From "chumico," the native name of this tree.

"Mountains exceeding 2000 feet in elevation, situated principally in Western Veraguas, possess a vegetation which resembles in many respects that of the Mexican highlands; one in which the forms of the torrid region are harmoniously blended with those of the temperate. Alders and blackberries are found with fuchsias and salvias; the brake grows in company with lupins and ageratums; oaks and palms are intermingled; fine large flowers are abundant. The genera represented are *Styrax*, *Rondeletia*, *Salvia*, *Lopezia*, *Fuchsia*, *Centradenia*, *Ageratum*, *Conostegia*, *Lupinus*, *Hypericum*, *Freziera*, *Galium*, *Smilax*, *Euphorbia*, *Rhopala*, *Equisetum*, *Clematis*, *Chorisia*, *Verbena*, *Condaminea*, *Inga*, *Solanum*, &c. The oaks, like most tropical ones, are scarcely higher than 30 feet, resembling neither in size nor in grandeur those which our heathen forefathers worshipped; their branches are smooth and devoid of that rugged appearance which renders those of the northern species so picturesque."

A further contribution to the botanical geography of Northern Panama by Dr. Moritz Wagner* supplements the foregoing, though the author has made some singular mistakes in the nomenclature of his plants, most of which, however, we have been able to correct.

"This flora [Chiriqui] is essentially the same as that of Eastern tropical South America, except in the higher regions between 3000 and 9000 feet †, where a certain number of species occur which are either common to Mexico and Guatemala or peculiar to this province alone. The characteristic species of the flora of this province as well as of that of the whole of Central America approach most nearly to those of Brazil,

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* "Physisch-geographische Skizze der Provinz Chiriqui," Petermann's 'Geographische Mittheilungen,' 1863, pp. 280–299.

† The 3 is probably a misprint for 8.

Guiana, and the coast of Venezuela and Colombia. It has also many species in common with the flora of the West Indies.

"This is accounted for partly by the similarity of their climate and partly by the currents of the sea, which especially favour the migration of species in this direction, whilst the trade-wind brings light seeds from the West Indies. The striking sameness of the vegetation of the coasts of both oceans affords an important proof of the existence of an earlier watercourse where the Isthmus of Panama now lies, and this is confirmed by geological discovery*. The Chiriqui flora has very little in common with Guatemala and Mexico, and still less with Ecuador and the highlands of Cundinamarca. Araucarias, cinchonas, and bushy chuquiraguas, which are so conspicuous a feature on the Andes within the tropical zone, no more occur on the Cordilleras of Chiriqui than do Mexican pines or oaks †. *Pinus occidentalis* ‡, which is predominant in the forests of the upper regions of Guatemala, is not found here, and seems to reach its southern limits at Fonseca Bay. No true pines are found in the woods of the Panama mountains. The number of endemic species in Chiriqui as compared with those extending to other parts of America is approximately as one to twenty-two.

"No other country in the world yields so large a number of important facts in connection with the geographical distribution of organisms, for the low-lying land of the isthmus constitutes but a slight barrier between the two oceans, while at the same time it affords a slender connecting-link for the migration of species of animals and plants between the two great halves of the American continent. The flora and fauna of the isthmus, too, when compared with those of West Africa, East Asia, and Polynesia, are of peculiar interest to zoological and botanical geography.

"A horizontal division of the flora presents three somewhat sharply defined longitudinal zones of the dominating features of the vegetation, which also coincide with physiognomical peculiarities of the landscape, namely:—

"1. *A Littoral zone.*—The vegetation of this zone is limited on the narrow dunes to such plants as love a soil strongly impregnated with salt. Further inland, varying according to the nature of the locality, these plants are associated with such as flourish in swampy places. Leguminosæ and Euphorbiaceæ abound on the dunes; while various species of *Acacia* and *Mimosa* greatly preponderate in individual numbers. They are mostly thick-stemmed stately trees, like their congeners in the forests of the interior, yet a certain starved appearance betrays a lack of sufficient nourishment in the sandy soil.

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* The inference is a false one, because the elements of the tropical littoral floras have such a very wide range.

† A little further on he cites two Mexican species of *Quercus* as inhabiting the Volcan de Chiriqui; and Araucarias can hardly be termed characteristic of the Andes.

‡ Probably *Pinus montezumæ*, though the specific limits of the Mexican and Central-American pines are still badly defined.

"*Ipomœa pescapræ* grows here in the wildest luxuriance, spreading its stems for 200 feet over the sandy dunes. The poisonous manzanilla tree (*Hippomane mancinella*) also flourishes in great profusion. The cocoa-nut palm, which is the finest and most beautiful of the trees of this zone, though succeeding tolerably well on the loose sandy soil of the coast, where it is exposed to the lashing of the breakers, grows to much greater perfection on the firmer ground further inland; and *Acrostichum aureum* covers wide tracts near it. *Crescentia cucurbitina* and *Paritium tiliaceum* often form almost impassable thickets round the cocoa-nut palms. At the mouths of the rivers *Rhizophora* and *Avicennia*, which always appear together, are conspicuous. The mangrove (*Rhizophora mangle*) forms impenetrable woods for about two nautical miles inland; its gnarled and crooked branches spread on all sides and bear numbers of aërial roots, which reach down to the ground.

"2. *The zone of tropical Forests of tall Evergreen Trees.*—The undergrowth is not luxuriant, and is formed chiefly of monocotyledons. This zone forms a belt on the Atlantic side, which is bounded by the littoral zone, and is twenty to twenty-two nautical miles broad in its centre. The trees here seldom lose their leaves. The zone lies within the limits of the damp precipitation, and is bounded on the south by the savana zone, where the drying trade-winds sweep over the country. Here abound great numbers of Rubiaceæ, Myrtaceæ, Melastomaceæ, Sterculiaceæ, Euphorbiaceæ, and Anacardiaceæ; fewer palms occur, and these consist chiefly of remarkably small species, such as *Chamædorea friedrichsthaliana*, *Trithrinax warscewiczii*, and *Bactris subglobosa*, associated with beautiful species of Cycadaceæ, Scitamineæ, and Bromeliaceæ. Among epiphytal and parasitical plants the Orchideæ, Piperaceæ, Bromeliaceæ, and Loranthaceæ are most richly represented.

"3. *The Savana zone.*—This only exists on the Pacific side of the isthmus, where it forms a grassy belt sixteen to eighteen miles broad, lying between the foot of the Cordilleras and the littoral zone of the Pacific Ocean, where the grass is interspersed with strips of woodland. This zone gives a lovely garden-like appearance to the southern landscape, and is far the most important for colonization. The trees and bushes seldom reach to the height and beauty of those of the damper wooded zone, except on the river-banks. Only such trees thrive as can stand the strong light and the four months of dry season, during which many of them lose their leaves. The grass, though partly creeping, is not thickly matted together. *Digitaria marginata* and *Paspalum notatum* are the most abundant species. *Paspalum virgatum*, *Setaria glauca*, *Panicum maximum*, *Eragrostis ciliaris*, *Isolepis junciformis*, *Cyperus flavomariscus*, *Rhynchospora comata*, and *Scleria nutans* are especially numerous.

"The Polygaleæ, Sauvagesiæ, Papilionaceæ, Ericaceæ, Euphorbiaceæ, Capparideæ, and Irideæ are the most numerously represented orders. In June and July the most beautiful flowers are *Polygala longicaulis* and *Sauvagesia pulchella.* The well-known

Mimosa pudica has a wonderfully wide range, and in many places covers quite half the savanas.

"The savanas of Central America are not bare treeless plains like the prairies of North America or the pampas of the Argentine Republic. Numerous variously-shaped groups of trees give endless variety to the country. Species of Verbenaceæ, Dilleniaceæ, Melastomaceæ, and Papilionaceæ are most numerous; and of trees *Miconia auriculata*, *M. impetiolaris*, *Hirtella racemosa*, *Duranta plumieri*, and *Curatella americana* may be mentioned.

"The southern slopes of the Cordillera may be divided into four altitudinal regions:—

"1. *The region of Evergreen Trees.*—Palms, Cyclanthaceæ, and Scitamineæ flourish on the northern side as high as 2000 feet, and on the southern side up to 1600 feet above the sea. The Verbenaceæ, Rubiaceæ, Papilionaceæ, Melastomaceæ, Euphorbiaceæ, Compositæ, Clusiaceæ, Myrtaceæ, Sterculiaceæ, and climbing Aroids are especially rich in species here. The undergrowth consists largely of species of *Heliconia*, having gigantic succulent leaves, and splendid, finely-coloured flowers. Species of Loganiaceæ, Smilacineæ, Simarubaceæ, Bromeliaceæ, and Compositæ are also numerous. The espavé tree (*Rhinocarpus excelsa*), most abundant on the river-banks, the ceiba-tree (*Eriodendron anfractuosum*), and the mahogany-tree are the finest and tallest trees of this region.

"2. *The region of Tree-ferns and Grasses and the showiest Mountain-orchids*, 2000 *to* 3500 *feet.*—Many species of the characteristic orders of the lower region begin to disappear, and beautiful tree- and bush-like ferns appear in great profusion. The monocotyledons of the undergrowth, especially the palms, Cyclanthaceæ, aroids, and the genus *Heliconia* decrease considerably, while epiphytal orchids flourish in the greatest variety. Of cultivated plants, the cacao, the vanilla, the indigo, and the sarsaparilla are wanting, and although the banana grows up to 4000 feet, it loses its beauty and value. The Verbenaceæ, Piperaceæ, Papilionaceæ, and Compositæ are as strongly represented as in lower altitudes. Various endemic Laurineæ, Tiliaceæ, Clusiaceæ, Apocynaceæ, and Vaccinieæ are peculiar to this region.

"3. *The Region of Rosaceæ, Labiatæ, and Compositæ*, 3500–4200 *feet.*—Although the characteristic species of these orders actually appear in the region immediately below, it is only here that they present themselves in such abundance, especially on the outskirts of the woods, as to constitute a prominent feature in the vegetation, and give the landscape its peculiar physiognomy. At this altitude, even during the 'verano,' the vegetation is the richest in flowers, and exhibits the greatest resemblance to the flora of Guatemala and Mexico. *Prunus*, *Rubus*, *Aster*, and *Ribes* are found associated with *Fuchsia*, *Salvia*, and *Lupinus*, in great variety. Oaks occur in large groups, though they belong more specially to the next region above. On the southern declivity of the Cordillera natural savanas of grasses and ferns ascend to this height, alternating with the woods. In addition to the orders already mentioned, the Verbenaceæ, Papilionaceæ, Ericaceæ, and Myrtaceæ are conspicuously represented.

"Among other characteristic species collected, I may mention *Rubus urticifolius*, *Echites veraguensis*, *Thibaudia longifolia*, *Psidium polycarpum*, and a beautiful new 'Leguminous' plant, *Picramnia seemanniana* *.

"4. *Region of Oaks, Alders, and Agave americana* †, 4200–8000 *feet.*—At this height, as in Mexico, certain plants appear which recall the temperate zone, and which look very strange mingled with the still numerous tropical types. Alpine palms, the *Agave americana*, peculiar in Chiriqui to this region, and tree-ferns are found as frequently with the oaks and alders as is the bramble. The species of oaks discovered by Dr. Seemann are *Quercus glabrescens* ‡, *Q. aristata*, and *Q. bumelioides*, and a fourth undescribed species was discovered near the summit of the Cordillera, and are all characteristic of this region. A species of alder (*Alnus mirbelii*), which extends as far north as Guatemala, and recalls the European Alpine alders, is associated with the oaks, and near them grows frequently a palm described by Œrsted (*Chamædorea pacaya*), which is found at an altitude of 7000 feet in the Barrancas of the Volcanos."

Although the foregoing sketch of the vegetation of Chiriqui is very imperfect and obviously incorrect in some of its details, and contains no description of its constituents above 8000 feet, it is sufficient to convey some idea of the composition and distribution of the Flora. It is probable that this article was never thoroughly finished, as we learn that it was delayed a considerable time through the illness of the author. That he was not mistaken in his altitudes is evident from the fact that he contributes a map of the country to the same volume of the "Mittheilungen," and on this map the Volcan de Chiriqui is marked as 11,265 feet high, and the Cerro Santiago, eastward near the Atlantic, as 9274. The highest ridges of the Cordillera proper are, however, between 7000 and 8000 feet.

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* *Picramnia seemaniana* is apparently an unpublished name, and the genus does not belong to the Leguminosæ.

† This, as explained under the distribution of plants of the *Agave* and *Yucca* type, should probably be *Furcræa*.

‡ *Quercus glabrescens*, Seem., non Benth., = *Q. warscewiczii*, Liebm., and *Q. aristata*, Seem., non Hook., = *Q. seemannii*, Liebm. (*vide* 'Botany of the Voyage of the Herald,' p. 251).

SUMMARY AND ANALYSIS OF THE FLORA.

Explanatory Remarks.

For all purposes of comparison, and as a means of conveying general ideas in botanical geography, the tabular form is indisputably the best, provided the table be intelligibly constructed and its elements easily seized. It is not sufficient to present to the reader one's own deductions without the data from which they were drawn, because no two persons probably would arrive at exactly the same conclusions from the same figures, inasmuch as they do not represent precisely definable quantities. Indeed, figures alone are misleading, and their real meaning can only be extracted by careful analysis. This by way of warning, and as an intimation that we do not too implicitly rely upon mere numbers of species in dealing with the constituents of the Flora. The following Table is a summary of an incomparably more extended one showing the distribution of each species, and very much too long and detailed for publication, as it would make a thick volume in itself. In abridging it to the reduced form here presented, no pains have been spared to attain the greatest possible degree of accuracy. A considerable number of proposed genera which were not recognized by Bentham and Hooker, nor by ourselves, are excluded; and no fewer than 1075 obscure species eliminated from the calculations now offered. The main consequence of these reductions is to lower the proportion of endemic species, with the advantage, probably, of bringing it nearer to what it really is in Nature. In all the large orders some species have been cancelled; but the bulk of the rejected ones belong to a few of the earlier orders which have not been recently monographed, and to the Gramineæ and Filices, of which the Mexican forms have lately been monographed, and the species, according to our views, unduly multiplied. As an illustration of the extent to which this rectification, if we may so term it, has been carried, it may be mentioned that the Malvaceæ suffer a reduction of one quarter of the species contained in the enumeration, and five of the genera are not counted, either because they are doubtful or because they are represented within our limits by cultivated species only. All cultivated plants have been left out of consideration, even such as are probably or certainly indigenous; likewise a number of cosmopolitan plants, which are of little interest from a geographical standpoint. The genus *Solanum* is another instance in which there is a great difference between the number of species enumerated and the number admitted in our comparisons, the reduction being from 139 to 100. Even after making all these reductions we feel convinced that many spurious species remain; but, judging from the percentage of distinct new species in recent collections, they are probably more than counterbalanced by unrecorded species. These observations refer almost exclusively to the Mexican flora *.

* As an example of what remains to be done, we may mention that, just as we are going to press, Mr. Sereno Watson sends us an Enumeration of Plants collected by Dr. E. Palmer in the State of Jalisco in 1886. It comprises about 675 species, whereof 104 are described as new; and there are three new genera.

Against these great reductions we have to place a few additions from recent collections made by Pringle and Palmer in North Mexico, and S. Watson and Bernoulli in Guatemala, but which came too late for insertion in the Supplement.

A few words explanatory of the plan and scope of the following Table, in which there are three primary divisions, will render it more easily comprehensible. The first division or section includes the whole of the natural orders as circumscribed in Bentham and Hooker's 'Genera Plantarum'; those not represented within our limits being separately numbered and printed in italics, and their general distribution * given in the corresponding sections—thus showing at a glance what is wanting in our flora. Below each natural order are the total numbers of admitted genera and species found in Mexico and Central America, and the total numbers of them endemic in or restricted to the whole area. The second division exhibits the numerical distribution of the genera and species in the subdivisions of Mexico and Central America, and the proportions endemic in Mexico, Guatemala, Honduras, and Salvador collectively, and in Nicaragua, Costa Rica, and Panama collectively. It will be understood that any discrepancy between the total of these two sums of endemic species and the total in the first section is accounted for by the fact that some of the endemic species are common to both areas. The third division shows the distribution of the genera and species which occur within our limits and extend beyond them. It is divided into two columns; the left-hand one referring to their extensions in America, and the right-hand one to countries beyond America. In the American column the total numbers of genera and species are given, followed by the numbers restricted to America †; and then the numbers extending respectively to western and eastern North America, to South America, and to the West Indies. This was the greatest degree of particularization admitted by the space; but further details will be found in succeeding tables. The extra-American column includes the rest of the world, even the Galapagos ‡, which properly belong to the American floral region, to which we have reckoned the Bermudas. "Widely" is employed to designate the distribution of such genera and species as occur in two or more of the other large divisions of the world. At first it was intended to attempt greater fulness in this column, especially in relation to the northern and southern hemispheres, but contingencies of space, and the desire to keep down the number of categories as low as was consistent with the main object in view, led to this being abandoned. This is in a measure compensated for by a series of paragraphs on the more interesting particulars of the general distribution of certain natural orders and peculiar types of plants.

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* The broad features of the distribution of the other orders are embodied in a subsequent table of their numerical sequence as to species in Mexico and Central America.

† To avoid confusion this is expressed by "Am. only;" and the term endemic is only used in connection with plants limited to Mexico and Central America.

‡ The connections between the flora of these islands and Mexico form the subject of a special paragraph.

In conclusion, it may be explained that the totals in the American column, added to the endemics in the first division, should equal the totals in the first division, except in the exceedingly rare instances of Mexican or Central-American genera and species extending beyond America but not to other parts of America. We believe there is no instance of a Mexican or Central-American species extending to other countries without also being found in some other part of America; but there are two genera, namely the variously circumscribed *Erblichia* and *Abelia*. Further, the totals mentioned in the extra-American column, added to the number of "America only," should equal the totals in the American column *.

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* Reference may here be made to Kotschy's 'Ueberblick der Vegetation Mexico's.' This is a very concise summary of the Flora of Mexico, read before the Vienna Academy of Sciences in February 1852, and, as appears in a footnote on the third page of a reprint, was intended as the forerunner of a '*Flora Mexicana, sive Enumeratio Plantarum in Regno Mexicanorum provenientium et hucusque in diversis operibus descriptarum.*' Moreover, in the concluding sentences of the summary, it is stated that this "Enumeration" was presented at the same time and was ready for the printer; and the writer goes on to say that he should esteem himself fortunate if it were considered worthy of a place in the publications of the Academy. From some cause it never was published, hence we could make no use of it; but from a table in the summary we extract the following figures:—Genera, including Acotyledones, 1680, comprising 7338 species; of which 1363 were from the "tierra caliente," 2677 from the "tierra templada," and 1537 from the "tierra fria." Kotschy further mentions that these plants were from the country lying between the sixteenth and twenty-third parallels of latitude. Whether the latter was a slip for thirty-third is doubtful; yet it is probable, though at that date little was known of the vegetation of Northern Mexico; otherwise the area corresponds very closely to our South Mexico.

GENERAL DISTRIBUTION OF THE VASCULAR PLANTS.

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
1. **Ranunculaceæ** .... Gen. 7 (endemic 0). Sp. 49 (endemic 27).	Gen.	total	7	5	..	4	..	1	2	1	Gen. 7 (Am. only, 0). N.W. Am. 7; N.E. Am. 6; S. Am. 5; W. I. 2.	7 gen. widely.
		end.										
	Sp.	total	23	29	3	9	..	2	2	1	Sp. 22 (Am. only, 18). N.W. Am. 8; N.E. Am. 5; S. Am. 9; W. I. 1.	3 sp. widely; 1 Asia.
		end.			24							
2. **Dilleniaceæ** ...... Gen. 4 (endemic 0). Sp. 17 (endemic 9).	Gen.	total	..	2	..	4	..	1	..	4	Gen. 4 (Am. only, 3). S. Am. 4; W. I. 4.	1 gen. widely.
		end.										
	Sp.	total	..	2	3	7	..	2	..	12	Sp. 8 (Am. only, 8). S. Am. 7; W. I. 1.	
		end.			5				4			
[I. *Calycanthaceæ*	......		....					....			1 *gen. N. Am.*	1 *gen. Japan and China.*]
3. **Magnoliaceæ**...... Gen. 3 (endemic 0). Sp. 6 (endemic 5).	Gen.	total	..	3	..	..	..	..	..	..	Gen. 3 (Am. only, 0). N.E. Am. 1; S. Am. 2; W. I. 1.	2 gen. Asia; 1 Borneo and Australia.
		end.										
	Sp.	total	..	5	1	..	..	..	..	..	Sp. 1 (Am. only, 1). S. Am. 1.	
		end.			5							
4. **Anonaceæ** .... Gen. 8 (endemic 1). Sp. 29 (endemic 23).	Gen.	total	..	7	..	5	..	2	..	3	Gen. 7 (Am. only, 5). N.E. Am. 1; S. Am. 5; W. I. 6.	1 gen. Asia; 1 Asia and Africa.
		end.			1							
	Sp.	total	..	17	..	6	..	2	..	7	Sp. 6 (Am. only, 6). S. Am. 5; W. I. 3.	
		end.			19				3			
5. **Menispermaceæ** .. Gen. 4 (endemic 1). Sp. 8 (endemic 5).	Gen.	total	..	1	1	1	..	1	1	2	Gen. 3 (Am. only, 1). N.W. Am. 1; N.E. Am. 1; S. Am. 3; W. I. 2.	2 gen. widely.
		end.			1							
	Sp.	total	..	3	1	2	..	1	1	4	Sp. 3 (Am. only, 2). N.W. Am. 1; S. Am. 2.	1 sp. widely.
		end.			3				1			
6. **Berberideæ** ...... Gen. 1 (endemic 0). Sp. 15 (endemic 11).	Gen.	total	1	1	..	..	..	..	1	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	6	10	1	..	..	..	1	..	Sp. 4 (Am. only, 4). N.W. Am. 3; W. I. 1.	
		end.			10				1			

Natural Orders with total numbers of Genera and species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
7. **Nymphæaceæ**	Gen.	total	1	3	..	1	..	1	..	1	Gen. 3 (Am. only, 1). N.W. Am. 2; N.E. Am. 3; S. Am. 3; W. I. 3.	2 gen. widely.
Gen. 3 (endemic 0).		end.										
Sp. 8 (endemic 3).	Sp.	total	1	5	..	2	..	2	..	1	Sp. 5 (Am. only, 4). N.W. Am. 3; N.E. Am. 1; S. Am. 3; W. I. 4.	1 sp. widely.
		end.			3							
[2. *Sarraceniaceæ*	......		......	......	......			......	......	......	1 *gen. California*; 1 *E. U. States*; 1 *Venezuela*.]	
8. **Papaveraceæ**	Gen.	total	4	2	..	1	..	..	2	1	Gen. 4 (Am. only, 2). N.W. Am. 2; S. Am. 1; W. I. 2.	1 gen. China and Japan.
Gen. 4 (endemic 1).		end.			1							
Sp. 8 (endemic 2).	Sp.	total	6	3	1	1	..	..	2	1	Sp. 6 (Am. only, 6). N.W. Am. 2; S. Am. 3; W. I. 2.	
		end.			2							
9. **Fumariaceæ**	Gen.	total	..	..	1	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1.	1 gen. widely.
Gen. 1 (endemic 0).		end.										
Sp. 1 (endemic 0).	Sp.	total	..	..	1	..	..	..	..	..	Sp. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1.	1 sp. E. Asia.
		end.										
10. **Cruciferæ**	Gen.	total	16	10	2	3	..	..	1	..	Gen. 18 (Am. only, 5). N.W. Am. 17; N.E. Am. 10; S. Am. 10; W. I. 3.	11 gen. widely; 2 Mediterranean region.
Gen. 20 (endemic 2).		end.			2							
Sp. 76 (endemic 42).	Sp.	total	44	35	2	3	..	..	1	..	Sp. 34 (Am. only, 30). N.W. Am. 29; N.E. Am. 10; S. Am. 2.	4 sp. widely.
		end.			41							
11. **Capparideæ**......	Gen.	total	5	7	3	3	..	..	3	2	Gen. 9 (Am. only, 4). N.W. Am. 5; N.E. Am. 2; S. Am. 7; W. I. 6.	5 gen. widely.
Gen. 10 (endemic 1).		end.			1							
Sp. 41 (endemic 20).	Sp.	total	7	18	8	5	..	..	5	8	Sp. 21 (Am. only, 20). N.W. Am. 6; N.E. Am. 2; S. Am. 10; W. I. 8.	1 sp. widely.
		end.			17				3			
12. **Resedaceæ**	Gen.	total	1	..	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1.	1 gen. widely.
Gen. 1 (endemic 0).		end.										
Sp. 1 (endemic 0).	Sp.	total	1	..	..	..	..	..	..	..	Sp. 1 (Am. only, 0). N.W. Am. 1.	1 sp. Canary I. to India.
		end.										
13. **Cistaceæ**	Gen.	total	2	1	1	1	..	..	..	..	Gen. 2 (Am. only, 1). N.W. Am. 1; N.E. Am. 2; S. Am. 1.	1 gen. Mediterranean region.
Gen. 2 (endemic 0).		end.										
Sp. 10 (endemic 7).	Sp.	total	5	3	3	1	..	..	..	..	Sp. 3 (Am. only, 3). N.E. Am. 3.	
		end.			7							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
14. **Violarieæ** ...... Gen. 6 (endemic 0). Sp. 37 (endemic 26).	Gen.	total	2	5	1	4	..	2	2	5	Gen. 6 (Am. only, 2). N.W. Am. 2; N.E. Am. 1; S. Am. 6; W. I. 5.	4 gen. widely.
		end.										
	Sp.	total	9	20	2	4	..	2	3	9	Sp. 11 (Am. only, 10). N.W. Am. 2; N.E. Am. 1; S. Am. 8; W. I. 4.	1 sp. widely.
		end.			19				5			
[3. *Canellaceæ*........	......		....					....			2 *gen. W. Ind., Colomb., and Brazil.*]	
15. **Bixineæ** .... Gen. 6 (endemic 0). Sp. 15 (endemic 9).	Gen.	total	1	4	..	2	..	2	1	5	Gen. 6 (Am. only, 4). N.W. Am. 1; S. Am. 5; W. I. 4.	2 gen. widely.
		end.										
	Sp.	total	2	8	..	2	..	2	1	8	Sp. 6 (Am. only, 6). N.W. Am. 1; S. Am. 5; W. I. 4.	
		end.			5				3			
16. **Polygalaceæ** .... Gen. 4 (endemic 0). Sp. 59 (endemic 34).	Gen.	total	3	4	..	3	1	1	1	3	Gen. 4 (Am. only, 2). N.W. Am. 2; N.E. Am. 2; S. Am. 4; W. I. 3.	2 gen. widely.
		end.										
	Sp.	total	27	28	3	16	1	1	2	8	Sp. 25 (Am. only, 25). N.W. Am. 7; N.E. Am. 7; S. Am. 13; W. I. 8.	
		end.			31				2			
[4. *Pittosporeæ*	......		....					....			....	1 *genus widely in O. World; the rest Australia.*]
[5. *Tremandreæ*......	......		....					....			....	*All Australia.*]
17. **Vochysiaceæ** .... Gen. 2 (endemic 0). Sp. 5 (endemic 3).	Gen.	total	..	..	..	1	..	1	..	2	Gen. 2 (Am. only, 2). S. Am. 2.	
		end.										
	Sp.	total	..	..	..	1	..	4	..	2	Sp. 2 (Am. only, 2). S. Am. 2.	
		end.							3			
18. **Frankeniaceæ**.... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	1	..	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1.	1 gen. widely.
		end.										
	Sp.	total	1	..	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1.	
		end.										
19. **Caryophyllaceæ** .. Gen. 10 (endemic 2). Sp. 50 (endemic 35).	Gen.	total	7	8	..	3	..	1	2	1	Gen. 8 (Am. only, 0). N.W. Am. 7; N.E. Am. 8; S. Am. 9; W. I. 2.	7 gen. widely; 1 Antarctic Isl. & Australasia.
		end.			2							
	Sp.	total	25	28	4	6	..	1	2	1	Sp. 15 (Am. only, 11). N.W. Am. 6; N.E. Am. 7; S. Am. 8; W. I. 2.	4 sp. widely.
		end.			34				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
20. **Portulaceæ**	Gen.	total	4	5	..	3	..	..	..	..	Gen. 6 (Am. only, 1). N.W. Am. 6; N.E. Am. 4; S. Am. 5; W.I. 2.	3 gen. widely; 1 Australia; 1 N.E. Asia.
Gen. 6 (endemic 0).		end.										
Sp. 15 (endemic 8).	Sp.	total	9	7	1	3	..	..	..	..	Sp. 7 (Am. only, 5). N.W. Am. 6; N.E. Am. 2; S. Am. 4; W. I. 2.	1 sp. widely; 1 Pacific Islands.
		end.			8							
21. **Tamariscineæ**	Gen.	total	1	1	..	..	..	..	..	..	Gen. 1 (Am. only, 1). N.W. Am. 1.	
Gen. 1 (endemic 0).		end.										
Sp. 3 (endemic 2).	Sp.	total	2	3	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1.	
		end.			2							
22. **Elatineæ**	Gen.	total	1	..	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1.	1 gen. widely.
Gen. 1 (endemic 0).		end.										
Sp. 1 (endemic 0).	Sp.	total	1	..	..	..	..	..	..	..	Sp. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1.	1 sp. widely.
		end.										
23. **Hypericineæ**	Gen.	total	2	3	..	2	..	..	..	2	Gen. 3 (Am. only, 1). N.W. Am. 1; N.E. Am. 2; S. Am. 3; W. I. 2.	1 gen. widely; 1 W. Africa.
Gen. 3 (endemic 0).		end.										
Sp. 20 (endemic 13).	Sp.	total	6	12	..	2	..	..	..	7	Sp. 7 (Am. only, 7). N.W. Am. 1; N.E. Am. 4; S. Am. 6; W. I. 3.	
		end.			10				3			
24. **Guttiferæ**	Gen.	total	..	1	..	3	..	1	1	7	Gen. 7 (Am. only, 3). S. Am. 7; W. I. 7.	2 gen. widely; 2 Madagascar and Africa.
Gen. 7 (endemic 0).		end.										
Sp. 24 (endemic 20).	Sp.	total	..	4	..	6	..	1	3	12	Sp. 4 (Am. only, 3). S. Am. 4; W. I. 3.	1 sp. W. Africa.
		end.			8				12			
25. **Ternstrœmiaceæ** ..	Gen.	total	2	7	..	2	..	3	2	7	Gen. 10 (Am. only, 6). N.E. Am. 1; S. Am. 8; W. I. 9.	3 gen. Asia; 1 Asia and Australia.
Gen. 10 (endemic 0).		end.										
Sp. 36 (endemic 27).	Sp.	total	3	17	..	4	..	3	2	11	Sp. 9 (Am. only, 9). N.E. Am. 1; S. Am. 7; W. I. 1.	
		end.			19				8			
[6. *Dipterocarpeæ*	......		....					....			....	1 *gen. Africa, remainder Asia.*]
[7. *Chlænaceæ*	......		....					....			....	*All Madagascar.*]

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
26. **Malvaceæ** ...... Gen. 26 (endemic 2). Sp. 182 (endemic 93).	Gen.	total	14	18	2	12	..	7	2	15	Gen. 24 (Am. only, 12). N.W. Am. 10; N.E. Am. 8; S. Am. 21; W. I. 13.	10 gen. widely; 1 S. Africa; 1 Madagascar.
		end.			2							
	Sp.	total	53	94	16	24	..	11	2	40	Sp. 89 (Am. only, 72). N.W. Am. 29; N.E. Am. 7; S. Am. 49; W. I. 38.	14 sp. widely; 1 Austr.; 1 W. Afr.; 1 India.
		end.			82				6			
27. **Sterculiaceæ** .... Gen. 15 (endemic 2). Sp. 48 (endemic 27).	Gen.	total	5	12	..	7	1	2	1	8	Gen. 13 (Am. only, 7). N.W. Am. 3; S. Am. 11; W. I. 8.	5 gen. widely; 1 Afr. and Arab.
		end.			2							
	Sp.	total	10	33	2	10	1	3	1	16	Sp. 21 (Am. only, 18). N.W. Am. 4; S. Am. 17; W. I. 7.	2 sp. widely; 1 W. Africa.
		end.			22				1			
28. **Tiliaceæ** .... Gen. 11 (endemic 0). Sp. 44 (endemic 27).	Gen.	total	4	10	..	5	1	7	1	10	Gen. 11 (Am. only, 8). N.E. Am. 2; S. Am. 9; W. I. 8.	3 gen. widely.
		end.										
	Sp.	total	7	28	2	7	1	9	1	17	Sp. 17 (Am. only, 16). N.E. Am. 3; S. Am. 13; W. I. 12.	1 sp. widely.
		end.			20				5			
29. **Linaceæ** .... Gen. 2 (endemic 0). Sp. 21 (endemic 13).	Gen.	total	1	2	..	1	..	..	1	1	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 1.	2 gen. widely.
		end.										
	Sp.	total	10	10	1	2	..	..	1	3	Sp. 8 (Am. only, 7). N.W. Am. 2; N.E. Am. 4; S. Am. 2; W. I. 1.	1 sp. Europe, N. As.
		end.			11				2			
[8. *Humiriaceæ*	......		.....	.....	.....			...	...	...	3 *gen. Guiana, Brazil, and St. Vincent.*	1 *gen. and sp. W. Afr.*]
30. **Malpighiaceæ** .... Gen. 17 (endemic 2). Sp. 104 (endemic 70).	Gen.	total	8	13	..	9	2	8	5	10	Gen. 15 (Am. only, 14). N.W. Am. 4; S. Am. 13; W. I. 11.	1 gen. Tropical Africa.
		end.			2							
	Sp.	total	21	49	6	15	2	14	5	24	Sp. 34 (Am. only, 34). N.W. Am. 5; S. Am. 27; W. I. 15.	
		end.			56				10			
31. **Zygophyllaceæ** .. Gen. 5 (endemic 2). Sp. 11 (endemic 6).	Gen.	total	4	3	..	2	..	1	..	1	Gen. 3 (Am. only, 2). N.W. Am. 2: N.E. Am. 3; S. Am. 1; W. I. 2.	1 gen. widely.
		end.			2							
	Sp.	total	6	5	1	3	..	1	..	1	Sp. 5 (Am. only, 4). N.W. Am. 3; N.E. Am. 2; S. Am. 3; W. I. 2.	1 sp. widely.
		end.			5							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
32. **Geraniaceæ**...... Gen. 5 (endemic 0). Sp. 49 (endemic 38).	Gen.	total	2	5	..	3	1	1	1	2	Gen. 5 (Am. only, 1). N.W. Am. 3; N.E. Am. 3; S. Am. 4; W. I. 1.	4 gen. widely.
		end.										
	Sp.	total	14	31	5	10	1	2	1	3	Sp. 11 (Am. only, 10). N.W. Am. 5; N.E. Am. 1; S. Am. 5; W. I. 2.	1 sp. widely.
		end.			35				1			
33. **Rutaceæ**........ Gen. 14 (endemic 6). Sp. 26 (endemic 19).	Gen.	total	9	9	..	2	..	2	..	1	Gen. 8 (Am. only, 5). N.W. Am. 5; N.E. Am. 2; S. Am. 4; W. I. 2.	2 gen. widely; 1 S. Africa.
		end.			6							
	Sp.	total	13	12	4	2	..	3	..	2	Sp. 7 (Am. only, 7). S. Am. 6; W. I. 1.	
		end.			16				2			
34. **Simarubeæ**...... Gen. 10 (endemic 2). Sp. 28 (endemic 17).	Gen.	total	3	5	..	2	..	2	2	4	Gen. 8 (Am. only, 7). N.W. Am. 3; N.E. Am. 1; S. Am. 7; W. I. 5.	1 gen. W. Africa.
		end.			2							
	Sp.	total	3	14	2	2	..	2	3	5	Sp. 11 (Am. only, 11). N.W. Am. 3; N.E. Am. 1; S. Am. 8; W. I. 4.	
		end.			15				2			
35. **Ochnaceæ** ...... Gen. 2 (endemic 0). Sp. 6 (endemic 3).	Gen.	total	..	1	..	1	1	..	..	2	Gen. 2 (Am. only, 1). S. Am. 2; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	2	..	1	1	..	..	2	Sp. 3 (Am. only, 3). S. Am. 2; W. I. 1.	
		end.			3							
36. **Burseraceæ**...... Gen. 2 (endemic 0). Sp. 31 (endemic 28).	Gen.	total	1	1	..	..	..	..	..	2	Gen. 2 (Am. only, 1). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 2.	1 gen. Galapagos.
		end.										
	Sp.	total	6	25	2	..	..	..	..	2	Sp. 3 (Am. only, 2). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 2.	1 sp. Galapagos.
		end.			28							
37. **Meliaceæ**........ Gen. 5 (endemic 0). Sp. 24 (endemic 15).	Gen.	total	..	4	..	3	1	5	2	2	Gen. 5 (Am. only, 0). S. Am. 5; W. I. 5.	2 gen. widely; S. Africa.
		end.										
	Sp.	total	..	10	6	6	1	6	2	3	Sp. 9 (Am. only, 9). S. Am. 7; W. I. 6.	
		end.			10				3			
38. **Chailletiaceæ** .... Gen. 1 (endemic 0). Sp. 1 (endemic 1).	Gen.	total	..	..	..	1	..	..	..	..	Gen. 1 (Am. only, 0). S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	..	..	1	..	..	..	..		
		end.			1							
39. **Olacineæ**........ Gen. 2 (endemic 0). Sp. 7 (endemic 5).	Gen.	total	1	2	..	2	1	..	..	1	Gen. 2 (Am. only, 0). S. Am. 2; W. I. 1.	1 gen. widely; 1 Asia.
		end.										
	Sp.	total	1	5	..	2	1	..	..	1	Sp. 2 (Am. only, 1). S. Am. 2; W. I. 2.	1 sp. widely.
		end.			5							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.								In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.		
40. **Ilicineæ** .... Gen. 1 (endemic 0). Sp. 7 (endemic 7).	Gen.	total	1	1	..	..	..	..	..	1	Gen. 1 (Am. only, 0). N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	1	4	..	..	..	..	..	2		
		end.			5				2			
[9. *Cyrillaceæ*	......		....					....			*N. and S. Am.*; *W. I.*]	
41. **Celastrineæ**...... Gen. 12 (endemic 3). Sp. 41 (endemic 30).	Gen.	total	6	9	..	2	..	2	..	2	Gen. 9 (Am. only, 5). N.W. Am. 5; N.E. Am. 4; S. Am. 6; W. I. 5.	3 gen. widely; 1 Sandwich I.
		end.			3							
	Sp.	total	8	27	3	2	..	2	..	7	Sp. 11 (Am. only, 11). N.W. Am. 5; N.E. Am. 3; S. Am. 4; W. I. 4.	
		end.			23				4			
[10. *Stackhousieæ*	......		....					....			....	1 *gen. Austral., N.Zeal., Philip. Isl.*]
42. **Rhamnaceæ** .... Gen. 10 (endemic 0). Sp. 42 (endemic 28).	Gen.	total	10	9	..	2	..	1	..	4	Gen. 10 (Am. only, 4). N.W. Am. 8; N.E. Am. 7; S. Am. 4; W. I. 2.	4 gen. widely; 1 Jap. & China; 1 trop. Asia.
		end.										
	Sp.	total	19	30	..	3	..	1	..	6	Sp. 14 (Am. only, 14). N.W. Am. 9; N.E. Am. 1; S. Am. 5; W. I. 2.	
		end.			26				2			
43. **Ampelideæ** ...... Gen. 1 (endemic 0). Sp. 22 (endemic 12).	Gen.	total	1	1	..	1	..	1	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	6	9	..	4	..	4	3	4	Sp. 10 (Am. only, 10). N.W. Am. 2; N.E. Am. 4; S. Am. 4; W. I. 3.	
		end.			7				4			
44. **Sapindaceæ**...... Gen. 17 (endemic 1). Sp. 93 (endemic 69).	Gen.	total	9	14	..	8	..	5	1	8	Gen. 16 (Am. only, 5). N.W. Am. 6; N.E. Am. 8; S. Am. 13; W. I. 10.	7 gen. widely; 2 Asia; 1 Japan; 1 Afr., Madag.
		end.										
	Sp.	total	18	55	2	15	..	13	5	24	Sp. 24 (Am. only, 21). N.W. Am. 5; N.E. Am. 3; S. Am. 15; W. I. 13.	3 sp. widely.
		end.			48				14			
45. **Sabiaceæ**........ Gen. 1 (endemic 0). Sp. 5 (endemic 5).	Gen.	total	..	1	..	..	..	..	1	..	Gen. 1 (Am. only, 0). S. Am. 1.	1 gen. Asia.
		end.										
	Sp.	total	..	1	2	..	..	..	2	..		
		end.			3				2			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.		Distribution of the Genera and Species in Mexico and Central America.								Distribution of the Genera and Species extending beyond Mexico and Central America.	
		Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
		North.	South.	Uncertain.							
46. **Anacardiaceæ** .. Gen. 11 (endemic 3). Sp. 40 (endemic 27).	Gen. total	3	9	..	3	..	..	2	3	Gen. 8 (Am. only, 5). N.W. Am. 2; N.E. Am. 1; S. Am. 6; W. I. 5.	2 gen. widely; 1 Canary I. to N.W. India.
	Gen. end.			3							
	Sp. total	8	27	4	4	..	..	2	5	Sp. 13 (Am. only, 13). N.W. Am. 4; N.E. Am. 2; S. Am. 4; W. I. 4.	
	Sp. end.			26				1			
47. **Coriarieæ** ...... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen. total	1	1	..	1	..	..	..	..	Gen. 1 (Am. only, 0). Temp. S. Am. 1.	1 gen. widely.
	Gen. end.										
	Sp. total	1	1	..	1	..	..	..	..	Sp. 1 (Am. only, 0). Temp. S. Am. 1.	1 sp. N. Zealand.
	Sp. end.										
[11. *Moringeæ*	......	....					....			....	1 *genus Africa and Asia.*]
48. **Connaraceæ**...... Gen. 3 (endemic 1). Sp. 9 (endemic 7).	Gen. total	..	2	..	3	..	1	..	3	Gen. 2 (Am. only, 0). S. Am. 2; W. I. 2.	2 gen. widely.
	Gen. end.										
	Sp. total	..	4	..	3	..	1	..	6	Sp. 2 (Am. only, 2). S. Am. 2; W. I. 2.	
	Sp. end.			3				3			
49. **Leguminosæ**: Gen. 110 (endemic 5). Sp. 944 (endemic 575).											
Papilionaceæ .. Gen. 78 (endemic 5). Sp. 611 (endemic 407).	Gen. total	39	62	..	26	6	31	21	44	Gen. 73 (Am. only, 32). N.W. Am. 25; N.E. Am. 23; S. Am. 55; W. I. 45.	34 gen. widely; 4 W. Afr.; 1 Galap.; 1 Asia; 1 Medit.
	Gen. end.			4							
	Sp. total	209	331	53	51	6	69	50	101	Sp. 204 (Am. only, 173). N.W. Am. 68; N.E. Am. 30; S. Am. 116; W. I. 77.	19 sp. widely; 10 W. Afr.; 2 Sandw. Isl.
	Sp. end.			350				35			
Cæsalpineæ .... Gen. 17 (endemic 0). Sp. 134 (endemic 58).	Gen. total	8	8	..	4	1	7	5	9	Gen. 17 (Am. only, 7). N.W. Am. 6; N.E. Am. 3; S. Am. 15; W. I. 12.	7 gen. widely; 1 Trop. Afr.; 2 S. Africa.
	Gen. end.										
	Sp. total	40	71	9	16	1	22	19	33	Sp. 76 (Am. only, 69). N.W. Am. 19; N.E. Am. 5; S. Am. 56; W. I. 31.	7 sp. widely.
	Sp. end.			44				7			
Mimoseæ ...... Gen. 15 (endemic 0). Sp. 199 (endemic 110).	Gen. total	9	14	..	10	2	13	8	12	Gen. 15 (Am. only, 4). N.W. Am. 10; N.E. Am. 6; S. Am. 15; W. I. 14.	9 gen. widely; 1 W. Africa; 1 Madagascar.
	Gen. end.										
	Sp. total	66	87	13	21	3	31	24	47	Sp. 89 (Am. only, 80 or 82). N.W. Am. 23; N.E. Am. 7; S. Am. 58; W. I. 23.	3 or 5 sp. widely; 2 W. Afr.; 1 Galap.; 1 Asia.
	Sp. end.			86				11			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
50. **Rosaceæ** .... Gen. 25 (endemic 2). Sp. 104 (endemic 62).	Gen.	total	14	19	2	8	2	4	1	5	Gen. 23 (Am. only, 9). N.W. Am. 15; N.E. Am. 9; S. Am. 15; W. I. 6.	12 gen. widely; 1 Trop. Afr.; 1 Antarctic.
		end.			2							
	Sp.	total	33	60	12	8	2	4	3	13	Sp. 42 (Am. only, 38). N.W. Am. 12; N.E. Am. 10; S. Am. 19; W. I. 4.	2 sp. W. Afr.; 1 Eur.; 1 Eur. and N. Asia.
		end.			54				6			
51. **Saxifragaceæ** .... Gen. 9 (endemic 0). Sp. 19 (endemic 11).	Gen.	total	7	7	..	1	..	..	2	..	Gen. 9 (Am. only, 4). N.W. Am. 5; N.E. Am. 3; S. Am. 5; W. I. 1.	3 gen. widely; 2 Asia.
		end.										
	Sp.	total	10	13	..	1	..	..	2	..	Sp. 8 (Am. only, 8). N.W. Am. 4; S. Am. 4; W. I. 1.	
		end.			10							
52. **Crassulaceæ** .... Gen. 3 (endemic 0). Sp. 62 (endemic 58).	Gen.	total	3	2	..	2	..	..	.	..	Gen. 3 (Am. only, 0). N.W. Am. 3; N.E. Am. 2; S. Am. 3.	3 gen. widely.
		end.										
	Sp.	total	16	22	25	2	..	..	..	..	Sp. 4 (Am. only, 4). N.W. Am. 4.	
		end.			58							
[12. *Droseraceæ*	......		....					....			2 *gen. N. Am.*; 1 *S. Am.*; 1 *W. I.*	1 *gen. widely*; 1 *Medit.*; 1 *Austral.*]
53. **Hamamelideæ** .. Gen. 1 (endemic 0). Sp. 3 (endemic 2).	Gen.	total	..	1	..	1	..	..	..	..	Gen. 1 (Am. only, 0). N.E. Am. 1.	1 gen. Asia.
		end.										
	Sp.	total	..	1	1	1	..	..	..	..	Sp. 1 (Am. only, 1). N.E. Am. 1.	
		end.			2							
[13. *Bruniaceæ*	......		....					....			....	*South Africa.*]
54. **Halorageæ** ...... Gen. 4 (endemic 0). Sp. 8 (endemic 2).	Gen.	total	2	3	..	..	..	..	1	..	Gen. 4 (Am. only, 1). N.W. Am. 2; N.E. Am. 3; S. Am. 3; W. I. 3.	3 gen. widely.
		end.										
	Sp.	total	4	3	..	..	..	..	1	..	Sp. 6 (Am. only, 5). N.W. Am. 1; N.E. Am. 5; S. Am. 1; W. I. 2.	1 sp. widely.
		end.			1				1			
55. **Rhizophoreæ** .... Gen. 2 (endemic 0). Sp. 2 (endemic 0).	Gen.	total	1	1	..	..	..	..	..	2	Gen. 2 (Am. only, 1). S. Am. 2; W. I. 2.	1 gen. widely.
		end.										
	Sp.	total	1	1	..	..	..	..	..	2	Sp. 2 (Am. only, 1). S. Am. 2; W. I. 2.	1 sp. W. Africa.
		end.										

Natural Orders with total numbers of Genera and Species in Mexico and Central America.			Distribution of the Genera and Species in Mexico and Central America.								Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
56. **Combretaceæ** .... Gen. 7 (endemic 0). Sp. 20 (endemic 9).	Gen.	total	..	5	..	3	2	1	..	4	Gen. 7 (Am. only, 1). N.E. Am. 1; S. Am. 7; W. I. 5.	3 gen. widely; 2 W. Afr.; 1 W. Afr. and Galapagos.
		end.										
	Sp.	total	..	6	1	5	4	1	..	8	Sp. 11 (Am. only, 7). N.E. Am. 1; S. Am. 11; W. I. 7.	1 sp. widely; 1 W. Africa and Galapagos; 2 W. Africa.
		end.			8				1			
57. **Myrtaceæ** ...... Gen. 12 (endemic 0). Sp. 58 (endemic 51).	Gen.	total	1	7	..	2	..	2	5	10	Gen. 12 (Am. only, 10). N.E. Am. 1; S. Am. 12; W. I. 9.	2 gen. widely.
		end.										
	Sp.	total	1	22	3	3	..	2	18	16	Sp. 7 (Am. only, 7). S. Am. 7; W. I. 1;	
		end.			23				24			
58. **Melastomaceæ** .. Gen. 29 (endemic 2). Sp. 139 (endemic 92).	Gen.	total	3	21	1	12	4	11	15	20	Gen. 27 (Am. only, 27). S. Am. 27; W. I. 15.	
		end.										
	Sp.	total	3	75	7	23	4	13	23	47	Sp. 47 (Am. only, 47). S. Am. 47; W. I. 22.	
		end.			62				15			
59. **Lythraceeæ**...... Gen. 9 (endemic 0). Sp. 82 (endemic 64).	Gen.	total	4	7	..	2	1	1	2	3	Gen. 9 (Am. only, 4). N.W. Am. 3; N.E. Am. 5; S. Am. 9; W. I. 8.	4 gen. widely; 1 Trop. Africa.
		end.										
	Sp.	total	15	54	11	10	1	2	5	9	Sp. 18 (Am. only, 12). N.W. Am. 2; N.E. Am. 5; S. Am. 14; W. I. 9.	3 sp. widely; 1 Sandw. I.; 1 Galap. I.; 1 Philip. I.
		end.			57				5			
60. **Onagrarieæ**...... Gen. 14 (endemic 5). Sp. 97 (endemic 67).	Gen.	total	9	11	..	6	1	1	2	3	Gen. 9 (Am. only, 3). N.W. Am. 8; N.E. Am. 6; S. Am. 5; W. I. 5.	4 gen. widely; 1 Tasm.; 1 N. Zeal.
		end.			5							
	Sp.	total	28	47	21	21	1	2	5	7	Sp. 30 (Am. only, 26). N.W. Am. 17; N.E. Am. 4; S. Am. 14; W. I. 9.	4 sp. widely.
		end.			62				4			
61. **Samydaceæ**...... Gen. 4 (endemic 0). Sp. 18 (endemic 10).	Gen.	total	..	3	1	1	..	1	..	3	Gen. 4 (Am. only, 2). S. Am. 3; W. I. 4.	2 gen. widely.
		end.										
	Sp.	total	..	9	2	2	..	1	..	9	Sp. 8 (Am. only, 8). S. Am. 8; W. I. 4.	
		end.			8				1			
62. **Loaseæ** .... Gen. 7 (endemic 1). Sp. 18 (endemic 10).	Gen.	total	4	4	1	1	..	..	..	2	Gen. 6 (Am. only, 5). N.W. Am. 4; N.E. Am. 1; S. Am. 4; W. I. 1.	1 gen. Galapagos.
		end.			1							
	Sp.	total	9	6	2	2	..	..	..	2	Sp. 8 (Am. only, 7). N.W. Am. 7; N.E. Am. 2; S. Am. 3; W. I. I.	1 sp. Galapagos.
		end.			9				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
63. **Turneraceæ** .... Gen. 3 (endemic 0). Sp. 7 (endemic 4).	Gen.	total	1	1	..	..	..	1	..	2	Gen. 3 (Am. only, 1). S. Am. 2; W. I. 1.	1 gen. Madagascar; 1 Africa & Madagascar.
		end.										
	Sp.	total	1	3	1	..	..	1	..	3	Sp. 3 (Am. only, 2). S. Am. 3; W. I. 2.	1 Galapagos, and widely colonized in India.
		end.			3				1			
64. **Passifloreæ** ...... Gen. 3 (endemic 0). Sp. 56 (endemic 25).	Gen.	total	1	2	1	1	..	2	1	1	Gen. 3 (Am. only, 2). N.W. Am. 1; N.E. Am. 1; S. Am. 3; W. I. 2.	1 gen. widely.
		end.										
	Sp.	total	5	29	10	6	..	9	4	13	Sp. 31 (Am. only, 30); S. Am. 27; W. I. 14.	1 sp. widely.
		end.			21				4			
65. **Cucurbitaceæ** .... Gen. 24 (endemic 6). Sp. 93 (endemic 62).	Gen.	total	8	19	3	6	..	7	8	10	Gen. 18 (Am. only, 11). N.W. Am. 7; N.E. Am. 7; S. Am. 18; W. I. 11.	5 gen. widely; 1 Galap.; 1 W. Afr.
		end.			6							
	Sp.	total	15	58	16	8	..	8	10	15	Sp. 31 (Am. only, 30). N.W. Am. 9; N.E. Am. 4; S. Am. 20; W. I. 15.	1 sp. China?
		end.			52				7			
66. **Begoniaceæ** .... Gen. 1 (endemic 0). Sp. 70 (endemic 66).	Gen.	total	1	1	1	1	..	1	1	1	Gen. 1 (Am. only, 0). S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	2	39	7	9	..	7	12	8	Sp. 4 (Am. only, 4). S. Am. 4; W. I. 2.	
		end.			47				17			
67. **Datiscaceæ** ...... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	..	1	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1.	1 gen. Asia.
		end.										
	Sp.	total	..	1	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1.	
		end.										
68. **Cactaceæ** .... Gen. 11 (endemic 2). Sp. 500 (endemic 438).	Gen.	total	5	11	..	3	..	1	1	3	Gen. 9 (Am. only, 6). N.W. Am. 4; N.E. Am. 2; S. Am. 8; W. I. 6.	1 gen. widely; 2 Galapagos.
		end.			2							
	Sp.	total	137	131	239	9	5	2	2	4	Sp. 62 (Am. only, 61). N.W. Am. 49; S. Am. 13; W. I. 6.	1 sp. widely.
		end.			431				7			
69. **Ficoideæ** .... Gen. 3 (endemic 0). Sp. 6 (endemic 1).	Gen.	total	3	2	..	..	1	1	..	1	Gen. 3 (Am. only, 0). N.W. Am. 1; N.E. Am. 3; S. Am. 3; W. I. 3.	3 gen. widely.
		end.										
	Sp.	total	4	5	..	..	1	1	..	1	Sp. 5 (Am. only, 1). N.W. Am. 1; N.E. Am. 3; S. Am. 4; W. I. 4.	3 sp. widely; 1 Galapagos.
		end.			1							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.									Distribution of the Genera and Species extending beyond Mexico and Central America.	
		Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
		North.	South.	Uncertain.							
70. **Umbelliferæ** .... Gen. 22 (endemic 2). Sp. 85 (endemic 55).	Gen. total	10	20	1	9	..	1	4	2	Gen. 20 (Am. only, 6). N.W. Am. 14; N.E. Am. 13; S. Am. 14; W. I. 2.	10 gen. widely; 2 Australasia; 1 Asia; 1 Canaries.
	Gen. end.			2							
	Sp. total	31	61	4	11	..	1	5	2	Sp. 30 (Am. only, 22). N.W. Am. 11; N.E. Am. 10; S. Am. 15; W. I. 3.	2 sp. widely; 3 Australasia; 1 S. Eur.; 1 W. Afr.; 1 Sandw. I.
	Sp. end.			52							
71. **Araliaceæ** ...... Gen. 6 (endemic 1). Sp. 30 (endemic 27).	Gen. total	1	4	..	1	1	1	1	4	Gen. 5 (Am. only 3). N.W. Am. 1; N.E. Am. 1; S. Am. 4; W. I. 2.	2 gen. Asia.
	Gen. end.							1			
	Sp. total	1	16	2	4	1	2	2	5	Sp. 3 (Am. only, 3). N.W. Am. 1; S. Am. 2; W. I. 2.	
	Sp. end.			19				6			
72. **Cornaceæ** ...... Gen. 2 (endemic 0). Sp. 10 (endemic 8).	Gen. total	2	2	..	..	..	..	..	..	Gen. 2 (Am. only, 1). N.W. Am. 2; N.E. Am. 1; W. I. 1.	1 gen. widely.
	Gen. end.										
	Sp. total	3	9	..	..	..	..	..	..	Sp. 2 (Am. only, 2). N.E. Am. 2.	
	Sp. end.			8							
73. **Caprifoliaceæ** .... Gen. 6 (endemic 1). Sp. 34 (endemic 27).	Gen. total	5	6	..	1	..	..	1	..	Gen. 5 (Am. only, 1). N.W. Am. 4; N.E. Am. 4; S. Am. 2; W. I. 2.	3 gen. widely; 1 Himal., China, and Japan.
	Gen. end.			1							
	Sp. total	7	24	1	3	..	..	5	..	Sp. 7 (Am. only, 7). N.W. Am. 5; N.E. Am. 2; S. Am. 1.	
	Sp. end.			22				4			
74. **Rubiaceæ** ...... Gen. 74 (endemic 9). Sp. 385 (endemic 295).	Gen. total	16	47	7	22	7	27	28	44	Gen. 65 (Am. only, 45). N.W. Am. 6; N.E. Am. 13; S. Am. 59; W. I. 41.	14 gen. widely; 4 Afr.; 1 Japan; 1 Polynesia.
	Gen. end.			4				3			
	Sp. total	41	202	47	36	7	53	60	69	Sp. 90 (Am. only, 88). N.W. Am. 8; N.E. Am. 12; S. Am. 49; W. I. 45.	1 sp. widely; 1 Antarct. I. and Australasia.
	Sp. end.			188				72			
75. **Valerianeæ** ...... Gen. 2 (endemic 0). Sp. 24 (endemic 21).	Gen. total	1	2	..	1	..	1	1	..	Gen. 2 (Am. only, 1). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 1.	1 gen. widely.
	Gen. end.										
	Sp. total	5	19	1	2	..	1	2	..	Sp. 3 (Am. only, 3). N.E. Am. 1; S. Am. 3; W. I. 1.	
	Sp. end.			21							
[14. *Dipsaceæ*	......	....					....			....	*Europe, Asia, and Africa.*]
[15. *Calycereæ*	......	....					....			*S. Am., mostly extra-tropical.*]	

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
76. **Compositæ**: Gen. 215 (endemic 45). Sp. 1518 (end. 1206).												
Vernoniaceæ . . Gen. 9 (endemic 1). Sp. 64 (endemic 48).	Gen.	total	1	4	. .	3	1	3	2	6	Gen. 8 (Am. only, 4). N.E. Am. 1; S. Am. 8; W. I. 6.	3 gen. widely; 1 Africa.
		end.			1							
	Sp.	total	8	31	5	9	1	9	4	11	Sp. 16 (Am. only, 14). N.E. Am. 1; S. Am. 11; W. I. 6.	1 sp. widely; 1 Africa.
		end.			39				8			
Eupatoriaceæ . . Gen. 22 (endemic 7). Sp. 319 (endemic 275).	Gen.	total	16	13	2	6	1	5	5	4	Gen. 15 (Am. only, 11 or 13). N.W. Am. 8; N.E. Am. 6; S. Am. 10; W. I. 5.	1 (or 4) gen. widely; 1 Polynesia.
		end.			6							
	Sp.	total	127	169	37	29	1	20	29	23	Sp. 44 (Am. only, 42). N.W. Am. 16; N.E. Am. 5; S. Am. 23; W. I. 9.	2 sp. widely (naturalized?); 1 Asia.
		end.			235				16			
Asteroideæ . . . . Gen. 23 (endemic 1). Sp. 208 (endemic 152).	Gen.	total	20	20	. .	5	1	3	3	2	Gen. 22 (Am. only, 16). N.W. Am. 20; N.E. Am. 5; S. Am. 11; W. I. 6.	5 gen. widely; 1 Asia.
		end.			1							
	Sp.	total	109	100	24	8	1	5	8	2	Sp. 56 (Am. only, 56). N.W. Am. 40; N.E. Am. 4; S. Am. 11; W. I. 8.	1 sp. widely naturalized.
		end.			145				3			
Inuloideæ . . . . Gen. 8 (endemic 0). Sp. 45 (endemic 25).	Gen.	total	6	5	. .	1	. .	2	1	1	Gen. 8 (Am. only, 3). N.W. Am. 5; N.E. Am. 4; S. Am. 6; W. I. 2.	4 gen. widely; 1 Africa.
		end.										
	Sp.	total	23	29	6	2	. .	5	4	1	Sp. 10 (Am. only, 10). N.W. Am. 6; N.E. Am. 3; S. Am. 3; W. I. 2.	
		end.			29							
Helianthoideæ Gen. 85 (endemic 23). Sp. 489 (endemic 401).	Gen.	total	57	64	4	34	4	28	23	20	Gen. 62 (Am. only, 50). N.W. Am. 29; N.E. Am. 23; S. Am. 50; W. I. 29.	8 gen. widely; 3 Afr.; 1 Galap.
		end.			17							
	Sp.	total	188	261	74	49	4	43	34	25	Sp. 88 (Am. only, 85). N.W. Am. 46; N.E. Am. 12; S. Am. 41; W. I. 30.	3 sp. widely.
		end.			353				26			
Helenioideæ . . Gen. 38 (endemic 10). Sp. 173 (endemic 116).	Gen.	total	29	24	2	5	2	6	3	1	Gen. 28 (Am. only, 26). N.W. Am. 24; N.E. Am. 12; S. Am. 11; W. I. 3.	1 gen. Africa; 1 Australia.
		end.			10							
	Sp.	total	106	68	17	8	2	9	5	3	Sp. 57 (Am. only, 57). N.W. Am. 44; N.E. Am. 4; S. Am. 11; W. I. 4.	
		end.			108				3			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
Anthemideæ .. Gen. 5 (endemic 0). Sp. 9 (endemic 1).	Gen.	total end.	3	4	..	..	..	..	..	..	Gen. 5 (Am. only, 2). N.W. Am. 4; N.E. Am. 3; S. Am. 3.	3 gen. widely.
	Sp.	total end.	7	4	.. 1	..	..	..	..	..	Sp. 8 (Am. only, 7). N.W. Am. 5; N.E. Am. 2; S. Am. 2.	1 sp. widely.
Senecionideæ .. Gen. 8 (endemic 3). Sp. 118 (endemic 106).	Gen.	total end.	4	6	.. 3	2	2	2	2	3	Gen. 5 (Am. only, 3). N.W. Am. 2; N.E. Am. 2; S. Am. 5; W. I. 3.	1 gen. widely; 1 Australia and New Zealand.
	Sp.	total end.	20	84	11 97	11	2	7	8 6	5	Sp. 12 (Am. only, 12). N.W. Am. 4; N.E. Am. 3; S. Am. 5; W. I. 4.	
Cynaroideæ.... Gen. 2 (endemic 0). Sp. 15 (endemic 12).	Gen.	total end.	2	1	..	1	..	1	1	..	Gen. 2 (Am. only, 0). N.W. Am. 2; N.E. Am. 2; S. Am. 1.	2 gen. widely.
	Sp.	total end.	4	10	.. 9	2	..	1	2 1	..	Sp. 3 (Am. only, 3). N.W. Am. 3; N.E. Am. 2.	
Mutisiaceæ .... Gen. 6 (endemic 0). Sp. 48 (endemic 41).	Gen.	total end.	4	5	..	4	2	1	4	2	Gen. 6 (Am. only, 6). N.W. Am. 4; N.E. Am. 2; S. Am. 6; W. I. 2.	
	Sp.	total end.	22	18	11 38	4	3	2	5 1	2	Sp. 7 (Am. only, 7). N.W. Am. 7; S. Am. 3; W. I. 1.	
Cichoriaceæ .. Gen. 9 (endemic 0). Sp. 30 (endemic 19).	Gen.	total end.	8	3	..	1	1	2	3	1	Gen. 9 (Am. only, 5). N.W. Am. 9; N.E. Am. 4; S. Am. 3; W. I. 2.	3 gen. widely; 1 Australia and New Zealand.
	Sp.	total end.	15	12	6 18	1	1	2	2	1	Sp. 11 (Am. only, 10). N.W. Am. 11; N.E. Am. 2; S. Am. 1; W. I. 1.	1 sp. widely.
[16. *Stylideæ*	......		....					....			1 *species Patagonia.*	2 *sp. Asia, the rest Australasia.*]
77. **Goodenovieæ** .... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total end.	..	..	1	..	..	..	..	..	Gen. 1 (Am. only, 0). N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
	Sp.	total end.	..	..	1	..	..	..	..	..	Sp. 1 (Am. only, 1). N.E. Am. 1; S. Am. 1; W. I. 1.	1 sp. widely.
78. **Campanulaceæ** .. Gen. 10 (endemic 1). Sp. 63 (endemic 50).	Gen.	total end.	4	5	2	5	1	1	5	2	Gen. 9 (Am. only, 4). N.W. Am. 5; N.E. Am. 3; S. Am. 8; W. I. 4.	5 gen. widely.
	Sp.	total end.	1	26	11 36	9	1	2	15 11	4	Sp. 13 (Am. only, 11). N.W. Am. 7; N.E. Am. 2; S. Am. 7; W. I. 3.	2 sp. widely.

Natural orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
79. **Vacciniaceæ** .... Gen. 4 (endemic 0). Sp. 30 (endemic 29).	Gen.	total	1	3	..	3	..	1	4	4	Gen. 4 (Am. only, 3). N.W. Am. 1; N.E. Am. 1; S. Am. 4; W. I. 2.	1 gen. widely.
		end.										
	Sp.	total	2	14	2	4	..	1	7	7	Sp. 1 (Am. only, 1). S. Am. 1.	
		end.			18				10			
80. **Ericaceæ** .... Gen. 9 (endemic 0). Sp. 58 (endemic 49).	Gen.	total	8	9	..	5	..	..	1	1	Gen. 9 (Am. only, 1). N.W. Am. 5.; N.E. Am. 6; S. Am. 5; W. I. 2.	5 gen. widely; 1 Madeira & E. As.; 1 Medit.; 1 Australasia.
		end.										
	Sp.	total	15	48	4	8	..	..	2	1	Sp. 9 (Am. only, 7). N.W. Am. 6; N.E. Am. 2; S. Am. 1; W. I. 1.	2 sp. widely.
		end.			46				2			
81. **Monotropeæ** .... Gen. 3 (endemic 0). Sp. 3 (endemic 0).	Gen.	total	2	2	..	1	..	..	..	1	Gen. 3 (Am. only, 1). N.W. Am. 3; N.E. Am. 3; S. Am. 1.	2 gen. Himalaya, China, and Japan.
		end.										
	Sp.	total	2	2	..	1	..	..	..	1	Sp. 3 (Am. only, 1). N.W. Am. 3; N.E. Am. 3; S. Am. 1.	2 sp. Himalaya, China, and Japan.
		end.										
[17. *Epacrideæ*	......		....					....			*A monotype in Patagonia.*	*The rest in Australasia, Malasia, and Polynesia.*]
[18. *Diapensiaceæ*	......		....					....			4 *gen. N. Am.*	1 *gen. Europe,* 1 *Tibet, and* 1 *Japan.*]
82. **Lennoaceæ** ...... Gen. 2 (endemic 2). Sp. 4. (endemic 4).	Gen.	total	2	1								
		end.			2							
	Sp.	total	2	2	1							
		end.			4							
83. **Plumbagineæ** .... Gen. 2 (endemic 0). Sp. 4 (endemic 1).	Gen.	total	1	1	1	..	..	1	..	1	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 2; S. Am. 2; W. I. 2.	2 gen. widely.
		end.										
	Sp.	total	3	2	1	..	..	1	..	1	Sp. 3 (Am. only, 2). N.W. Am. 1; N.E. Am. 3; S. Am. 2.	1 sp. Europe, N. Africa.
		end.			1							
84. **Primulaceæ** ...... Gen. 4 (endemic 0). Sp. 5 (endemic 0).	Gen.	total	4	2	..	1	..	..	1	..	Gen. 4 (Am. only, 0). N.W. Am. 4; N.E. Am. 4; S. Am. 3; W. I. 2.	3 gen. widely; 1 E. Asia.
		end.										
	Sp.	total	4	2	..	1	..	..	1	..	Sp. 5 (Am. only, 2). N.W. Am. 3; N.E. Am. 4; S. Am. 1; W. I. 2.	1 sp. widely; 1 Europe; 1 E. Asia.
		end.										

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.								In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.		
85. **Myrsineæ**	Gen.	total	1	5	..	1	1	3	6	5	Gen. 6 (Am. only, 3). N.E. Am. 2; S. Am. 6; W. I. 6.	2 gen. widely; 1 Philippine I.
Gen. 7 (endemic 1).		end.			1							
Sp. 46 (endemic 33).	Sp.	total	1	14	7	1	1	7	16	9	Sp. 13 (Am. only, 13). N.E. Am. 2; S. Am. 7; W. I. 9.	
		end.			14				19			
86. **Sapotaceæ**	Gen.	total	1	3	..	1	1	1	..	3	Gen. 5 (Am. only, 2). N.W. Am. 1; N.E. Am. 2; S. Am. 5; W. I. 5.	2 gen. widely; 1 Australasia.
Gen. 5 (endemic 0).		end.										
Sp. 16 (endemic 10).	Sp.	total	2	8	5	1	1	1	..	3	Sp. 6 (Am. only, 6). N.W. Am. 2; N.E. Am. 1; S. Am. 3; W. I. 4.	
		end.			10							
87. **Ebenaceæ**	Gen.	total	1	2	..	..	..	..	..	..	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 2.	2 gen. widely.
Gen. 2 (endemic 0).		end.										
Sp. 7 (endemic 5).	Sp.	total	1	4	2	..	..	..	..	..	Sp. 2 (Am. only, 2). S. Am. 1; W. I. 2.	
		end.			5							
88. **Styraceæ**	Gen.	total	..	2	..	1	..	..	1	1	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 2; S. Am. 2; W. I. 2.	2 gen. widely.
Gen. 2 (endemic 0).		end.										
Sp. 14 (endemic 12).	Sp.	total	..	11	..	1	..	..	1	1	Sp. 2 (Am. only, 2). S. Am. 1; W. I. 1.	
		end.			12							
89. **Oleaceæ**	Gen.	total	3	3	..	..	..	..	..	..	Gen. 3 (Am. only, 1). N.W. Am. 3; N.E. Am. 2; S. Am. 2; W. I. 2.	1 gen. widely; 1 S. Africa.
Gen. 3 (endemic 0).		end.										
Sp. 16 (endemic 5).	Sp.	total	14	5	..	..	..	..	..	..	Sp. 11 (Am. only, 11). N.W. Am. 10; N.E. Am. 1; W. I. 1.	
		end.			5							
[19. *Salvadoraceæ*	......		....					....			....	*Trop. and Sub-trop. Asia and Africa.*]
90. **Apocynaceæ**	Gen.	total	8	16	..	7	4	5	2	9	Gen. 22 (Am. only, 15). N.W. Am. 5; N.E. Am. 4; S. Am. 17; W. I. 16.	3 gen. widely; 2 E. Asia; 1 Afr.; 1 Galapagos.
Gen. 23 (endemic 1).		end.			1							
Sp. 78 (endemic 51).	Sp.	total	14	44	8	7	4	5	2	14	Sp. 27 (Am. only, 27). N.W. Am. 7; N.E. Am. 3; S. Am. 14; W. I. 9.	
		end.			48				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.			Distribution of the Genera and Species in Mexico and Central America.								Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
91. **Asclepiadeæ** .... Gen. 21 (endemic 3). Sp.153 (endemic120).	Gen.	total	10	16	1	5	..	3	2	6	Gen. 18 (Am. only, 15). N.W. Am. 6; N.E. Am. 6; S. Am. 16; W. I. 9.	2 gen. widely; 1 Africa.
		end.			3							
	Sp.	total	52	86	15	13	..	4	3	7	Sp. 33 (Am. only, 33). N.W. Am. 23; N.E. Am. 4; S. Am. 7; W. I. 7.	
		end.			114				4			
92. **Loganiaceæ**...... Gen. 7 (endemic 1). Sp. 36 (endemic 27).	Gen.	total	3	4	1	3	..	1	2	3	Gen. 6 (Am. only, 2). N.W. Am. 1; N.E. Am. 4; S. Am. 4; W. I. 5.	3 gen. widely; 1 E. Asia.
		end.			1							
	Sp.	total	8	25	4	5	..	2	2	4	Sp. 9 (Am. only, 9). N.W. Am. 3; N.E. Am. 3; S. Am. 4; W. I. 4.	
		end.			24				3			
93. **Gentianeæ** ...... Gen. 12 (endemic 1). Sp. 62 (endemic 44).	Gen.	total	5	10	..	6	2	2	3	5	Gen. 18 (Am. only, 6). N.W. Am. 3; N.E. Am. 5; S. Am. 9; W. I. 9.	3 gen. widely; 1 Africa; 1 Asia.
		end.			1							
	Sp.	total	15	32	11	9	2	3	4	8	Sp. 18 (Am. only, 16). N.W. Am. 5; N.E. Am. 3; S. Am. 11; W. I. 6.	2 sp. Europe and Asia.
		end.			38				1			
94. **Polemoniaceæ**.... Gen. 7 (endemic 1). Sp. 31 (endemic 17).	Gen.	total	5	5	..	2	1	1	2	1	Gen. 6 (Am. only, 4). N.W. Am. 5; N.E. Am. 4; S. Am. 5.	1 gen. widely; 1 E. Asia.
		end.			1							
	Sp.	total	22	13	1	3	1	3	3	2	Sp. 14 (Am. only, 14). N.W. Am. 13; S. Am. 2.	
		end.			15							
95. **Hydrophyllaceæ**.. Gen. 5 (endemic 0). Sp. 32 (endemic 17).	Gen.	total	3	4	..	3	..	1	..	1	Gen. 5 (Am. only, 4). N.W. Am. 4; N.E. Am. 4; S. Am. 4; W. I. 3.	1 gen. widely.
		end.										
	Sp.	total	21	13	5	5	..	2	..	1	Sp. 15 (Am. only, 15). N.W. Am. 11; N.E. Am. 1; S. Am. 5; W. I. 3.	
		end.			16							
96. **Boragineæ** ...... Gen. 17 (endemic 0). Sp. 120 (endemic 65).	Gen.	total	13	12	..	4	1	1	1	2	Gen. 17 (Am. only, 7). N.W. Am. 11; N.E. Am. 7; S. Am. 9; W. I. 7.	10 gen. widely.
		end.										
	Sp.	total	47	62	10	11	4	2	1	10	Sp. 55 (Am. only, 53). N.W. Am. 30; N.E. Am. 3; S. Am. 20; W. I. 19.	2 sp. widely.
		end.			63							
97. **Convolvulaceæ** .. Gen. 9 (endemic 0). Sp. 141 (endemic 71).	Gen.	total	8	8	7	7	4	4	4	6	Gen. 9 (Am. only, 1). N.W. Am. 6; N.E. Am. 8; S. Am. 7; W. I. 5.	6 gen. widely; 1 Africa; 1 Australia.
		end.										
	Sp.	total	51	79	29	25	7	12	6	24	Sp. 70 (Am. only, 57). N.W. Am. 25; N.E. Am. 17; S. Am. 51; W. I. 39.	12 sp. widely; 1 Africa.
		end.			65				3			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
98. **Solanaceæ** ...... Gen. 26 (endemic 2). Sp.230(endemic 148).	Gen.	total	12	17	1	11	2	5	7	7	Gen. 24 (Am. only, 19). N.W. Am. 10; N.E. Am. 5; S. Am. 22; W. I. 11.	4 gen. widely; 1 Australia and Polynesia.
		end.			2							
	Sp.	total	52	126	36	22	5	18	15	28	Sp. 82 (Am. only, 73). N.W. Am. 31; N.E. Am. 2; S. Am. 49; W. I. 31.	9 sp. widely.
		end.			133				4			
99. **Scrophularineæ** .. Gen. 42 (endemic 9). Sp.170(endemic 103).	Gen.	total	21	31	2	15	3	10	11	10	Gen. 33 (Am. only, 12). N.W. Am. 17; N.E. Am. 17; S. Am. 24; W. I. 12.	13 gen. widely; 3 Afr.; 2 E. As.; 1 Madag.; 1 Eur. & Afr.; 1 N. Zeal.
		end.			8							
	Sp.	total	72	90	14	24	3	13	19	15	Sp. 67 (Am. only, 58). N.W. Am. 33; N.E. Am. 16; S. Am. 30; W. I. 13.	5 sp. widely; 3 Africa; 1 Asia.
		end.			96				7			
100. **Orobanchaceæ** .. Gen. 3 (endemic 0). Sp. 8 (endemic 5).	Gen.	total	1	2	1	..	..	..	..	..	Gen. 3 (Am. only, 2). N.W. Am. 2; N.E. Am. 2; S. Am. 1.	1 gen. Himalaya and E. Asia.
		end.										
	Sp.	total	4	4	1	..	..	..	..	..	Sp. 3 (Am. only, 3). N.W. Am. 3; N.E. Am. 2.	
		end.			5							
101. **Lentibularieæ** .. Gen. 2 (endemic 0). Sp. 18 (endemic 12).	Gen.	total	2	2	..	..	..	1	1	1	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 2; S. Am. 2; W. I. 2.	2 gen. widely.
		end.										
	Sp.	total	4	8	5	..	..	1	1	2	Sp. 6 (Am. only, 5). N.W. Am. 1; N.E. Am. 2; S. Am. 4; W. I. 3.	1 sp. widely.
		end.			11				1			
[20. *Columelliaceæ*....	......		....					....			1 *gen. and* 2 *sp. Andes.*]	
102. **Gesneraceæ** .... Gen. 23 (endemic 3). Sp.144(endemic 133).	Gen.	total	1	11	1	12	..	4	15	7	Gen. 19 (Am. only, 19). S. Am. 17; W. I. 9.	1 gen. Asia.
		end.			3							
	Sp.	total	1	33	16	24	..	7	62	15	Sp. 11 (Am. only, 11). S. Am. 10; W. I. 2.	
		end.			61				69			
103. **Bignoniaceæ**.... Gen. 14 (endemic 1). Sp. 51 (endemic 28).	Gen.	total	3	7	1	4	2	1	3	11	Gen. 13 (Am. only, 12). N.W. Am. 2; N.E. Am. 2; S. Am. 12; W. I. 9.	1 gen. widely.
		end.							1			
	Sp.	total	4	22	5	5	2	1	3	25	Sp. 23 (Am. only, 23). N.W. Am. 2; N.E. Am. 1; S. Am. 20; W. I. 11.	
		end.			19				7			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
104. **Pedalineæ** ...... Gen. 1 (endemic 0). Sp. 6 (endemic 2).	Gen.	total	1	1	..	..	..	1	..	..	Gen. 1 (Am. only, 1). N.W. Am. 1; S. Am. 1; W. I. 1.	
		end.										
	Sp.	total	2	4	1	..	..	1	..	..	Sp. 4 (Am. only, 4). N.W. Am. 3; S. Am. 1; W. I. 1.	
		end.			2							
105. **Acanthaceæ** .... Gen. 38 (endemic 11). Sp.165(endemic 119).	Gen.	total	15	28	1	12	6	15	8	15	Gen. 27 (Am. only, 14). N.W. Am. 11; N.E. Am. 7; S. Am. 25; W. I. 16.	11 gen. widely; 1 Galapagos; 1 Africa.
		end.			6				3			
	Sp.	total	33	95	15	15	4	19	27	24	Sp. 46 (Am. only, 45). N.W. Am. 13; N.E. Am. 5; S. Am. 31; W. I. 16.	1 sp. widely.
		end.			87				21			
[21. *Myoporineæ*	......		....					....			1 *monotype W. Ind.*	*Widely, but chiefly Australasian.*]
[22. *Selagineæ*	......		....					....			....	*Few in Asia and Europe, the rest African, chiefly South.*]
106. **Verbenaceæ** .... Gen. 17 (endemic 0). Sp. 87 (endemic 43).	Gen.	total	7	16	..	9	2	2	3	11	Gen. 17 (Am. only, 7). N.W. Am. 3; N.E. Am. 9; S. Am. 17; W. I. 17.	10 gen. widely.
		end.										
	Sp.	total	20	50	19	13	3	3	5	14	Sp. 44 (Am. only, 41). N.W. Am. 10; N.E. Am. 4; S. Am. 27; W. I. 21.	3 sp. widely.
		end.			35				3			
107. **Labiatæ** ...... Gen. 29 (endemic 2). Sp.250(endemic 180).	Gen.	total	22	23	..	9	2	5	8	5	Gen. 27 (Am. only, 13). N.W. Am. 21; N.E. Am. 18; S. Am. 17; W. I. 9.	11 gen. widely; 1 Sandw. I.; 1 E. As.; 1 Can. I.
		end.			1							
	Sp.	total	77	152	49	28	3	15	19	17	Sp. 70 (Am. only, 59). N.W. Am. 28; N.E. Am. 16; S. Am. 30; W. I. 21.	4 sp. widely; 4 Galap.; 1 Polyn.; 1 Ind.; 1 Afr.
		end.			167				6			
108. **Plantagineæ**.... Gen. 1 (endemic 0). Sp. 9 (endemic 6).	Gen.	total	1	1	..	1	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	5	6	1	1	..	..	..	..	Sp. 3 (Am. only, 3). N.W. Am. 2; N.E. Am. 2; S. Am. 3; W. I. 1.	
		end.			6							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.			Distribution of the Genera and Species in Mexico and Central America.								Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
109. **Nyctagineæ** .... Gen. 14 (endemic 2). Sp. 54 (endemic 23).	Gen.	total	9	10	..	3	..	2	..	3	Gen. 12 (Am. only, 9). N.W. Am. 8; N.E. Am. 3; S. Am. 5; W. I. 5.	2 gen. widely; 1 Himalaya.
		end.			2							
	Sp.	total	36	21	5	4	..	2	..	5	Sp. 31 (Am. only, 29). N.W. Am. 22; N.E. Am. 6; S. Am. 3; W. I. 6.	1 sp. widely; 1 Galapagos.
		end.			20				2			
110. **Illecebraceæ**.... Gen. 4 (endemic 0). Sp. 7 (endemic 4).	Gen.	total	4	3	..	..	..	..	..	..	Gen. 4 (Am. only, 2). N.W. Am. 3; N.E. Am. 1; S. Am. 3.	2 gen. widely.
		end.										
	Sp.	total	6	3	..	..	..	..	..	..	Sp. 3 (Am. only, 3). N.W. Am. 2; S. Am. 1.	
		end.			4							
111. **Amarantaceæ** .. Gen. 20 (endemic 0). Sp. 68 (endemic 34).	Gen.	total	13	12	3	5	2	7	3	5	Gen. 20 (Am. only, 11). N.W. Am. 9; N.E. Am. 5; S. Am. 16; W. I. 14.	7 gen. widely; 1 Galapagos; 1 Africa.
		end.										
	Sp.	total	33	28	13	6	2	7	3	9	Sp. 34 (Am. only, 28). N.W. Am. 10; N.E. Am. 7; S. Am. 20; W. I. 20.	3 sp. widely; 3 Africa.
		end.			32							
112. **Chenopodiaceæ**.. Gen. 8 (endemic 0). Sp. 28 (endemic 9).	Gen.	total	6	3	1	2	..	1	1	2	Gen. 8 (Am. only, 3). N.W. Am. 6; N.E. Am. 3; S. Am. 6; W. I. 4.	5 gen. widely.
		end.										
	Sp.	total	20	6	4	2	..	2	1	3	Sp. 19 (Am. only, 17). N.W. Am. 13; N.E. Am. 6; S. Am. 4; W. I. 3.	1 sp. widely; 1 S.E. Europe and Asia.
		end.			9							
113. **Phytolaccaceæ** .. Gen. 8 (endemic 1). Sp. 10 (endemic 2).	Gen.	total	2	5	..	4	..	4	1	3	Gen. 7 (Am. only, 6). N.W. Am. 2; N.E. Am. 2; S. Am. 5; W. I. 6.	1 gen. widely.
		end.										
	Sp.	total	2	6	..	5	..	4	1	3	Sp. 8 (Am. only, 8). N.W. Am. 2; N.E. Am. 1; S. Am. 6; W. I. 7.	1 sp. widely naturalized.
		end.			2							
[23. *Batideæ*	......		......	......	......	......	......	......	......	......	1 *gen. and* 1 *sp. Florida to Brazil, and in California.*	*Also in Sandwich Islands.*]
114. **Polygonaceæ** .. Gen. 11 (endemic 1). Sp. 59 (endemic 21).	Gen.	total	5	10	..	5	2	1	2	5	Gen. 10 (Am. only, 7). N.W. Am. 4; N.E. Am. 3; S. Am. 9; W. I. 3.	2 gen. widely; 1 Australasia and Polynesia.
		end.			1							
	Sp.	total	25	17	11	9	2	1	2	8	Sp. 38 (Am. only, 32). N.W. Am. 16; N.E. Am. 9; S. Am. 18; W. I. 6.	6 sp. widely.
		end.			18				3			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
115. **Podostemaceæ** ..	Gen.	total	..	3	..	2	..	1	1	1	Gen. 3 (Am. only, 2). S. Am. 3; W. I. 1.	1 gen. Africa and Madagascar.
Gen. 4 (endemic 1).		end.			1							
Sp. 11 (endemic 9).	Sp.	total	..	8	1	3	..	1	1	1	Sp. 2 (Am. only, 1). S. Am. 2.	1 sp. Africa and Madagascar.
		end.			8							
[24. *Nepenthaceæ*	......		....	....	....	....	....	....	....	....	....	1 *gen. Asia, Australasia, and Mascarene Is.*]
116. **Cytinaceæ**	Gen.	total	..	1	..	..	..	..	..	..	....	1 gen. Medit. region and S. Africa.
Gen. 1 (endemic 0).		end.										
Sp. 2 (endemic 2).	Sp.	total	..	2	..	..	..	..	..	..		
		end.			2							
117. **Aristolochiaceæ**	Gen.	total	1	1	..	1	1	..	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
Gen. 1 (endemic 0).		end.										
Sp. 30 (endemic 24).	Sp.	total	1	15	6	4	1	..	3	5	Sp. 6 (Am. only, 6). N.W. Am. 1; S. Am. 3; W. I. 4.	
		end.			20				3			
118. **Piperaceæ**	Gen.	total	2	3	..	2	1	2	2	2	Gen. 3 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 2.	2 gen. widely; 1 Himal., China, and Japan.
Gen. 3 (endemic 0).		end.										
Sp. 214 (endemic 167).	Sp.	total	2	103	33	15	4	19	44	33	Sp. 47 (Am. only, 45). N.W. Am. 1; S. Am. 37; W. I. 30.	1 sp. widely; 1 Africa.
		end.			103				54			
119. **Chloranthaceæ** ..	Gen.	total	..	1	..	..	..	..	1	..	Gen. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
Gen. 1 (endemic 0).		end.										
Sp. 3 (endemic 3).	Sp.	total	..	2	..	..	..	..	1	..		
		end.			2				1			
120. **Myristicaceæ** ..	Gen.	total	..	1	..	1	..	..	..	1	Gen. 1 (Am. only, 0). S. Am. 1; W. I. 1.	1 gen. widely; chiefly Asia.
Gen. 1 (endemic 0).		end.										
Sp. 3 (endemic 3).	Sp.	total	..	1	..	1	..	..	..	1		
		end.			2				1			
121. **Monimiaceæ**	Gen.	total	..	2	..	..	..	1	..	2	Gen. 2 (Am. only, 1). S. Am. 2; W. I. 2.	1 gen. Australia.
Gen. 2 (endemic 0).		end.										
Sp. 10 (endemic 8).	Sp.	total	..	4	..	..	..	1	..	5	Sp. 2 (Am. only, 2). S. Am. 1; W. I. 2.	
		end.			4				4			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
122. **Laurineæ** ...... Gen. 9 (endemic 0). Sp. 36 (endemic 25).	Gen.	total	1	6	2	1	..	1	3	4	Gen. 9 (Am. only, 4). N.E. Am. 1; S. Am. 7; W. I. 6.	4 gen. widely; 1 Africa and Mascarene Isl.
		end.										
	Sp.	total	1	22	7	1	..	1	3	7	Sp. 11 (Am. only, 11). N.E. Am. 1; S. Am. 9; W. I. 6.	
		end.		20					4			
123. **Proteaceæ** ...... Gen. 1 (endemic 0). Sp. 5 (endemic 2).	Gen.	total	..	1	..	1	..	..	1	1	Gen. 1 (Am. only, 0). S. Am. 1; W. I. 9.	1 gen. New Caledonia.
		end.										
	Sp.	total	..	1	..	1	..	..	2	3	Sp. 3 (Am. only, 3). S. Am. 3.	
		end.			2							
124. **Thymelæaceæ** .. Gen. 1 (endemic 0). Sp. 4 (endemic 4).	Gen.	total	..	1	..	..	..	..	..	..	Gen. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
		end.										
	Sp.	total	..	4	..		..	..	..	..		
		end.			4							
[25. *Penæaceæ*	......		....					....			....	4 *gen. South Africa.*]
[26. *Elæagnaceæ*	......		....					....			3 *gen. N. Am.*	2 *of the gen. Europe and Asia and* 1 *Australia.*]
125. **Loranthaceæ** .. Gen. 5 (endemic 0). Sp. 65 (endemic 46).	Gen.	total	3	3	..	3	1	2	4	3	Gen. 5 (Am. only, 3). N.W. Am. 2; N.E. Am. 2; S. Am. 4; W. I. 3.	1 gen. widely; 1 Europe and W. Asia.
		end.										
	Sp.	total	8	34	8	5	2	5	13	13	Sp. 19 (Am. only, 18). N.W. Am. 6; N.E. Am. 1; S. Am. 12; W. I. 6.	1 sp. S. Europe and W. Asia.
		end.		28					7			
126. **Santalaceæ** .... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	1	..	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1.	1 gen. S. Europe.
		end.										
	Sp.	total	1	..	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1; N.E. Am. 1.	
		end.										
127. **Balanophoreæ** .. Gen. 3 (endemic 0). Sp. 3 (endemic 0).	Gen.	total	..	2	..	..	..	..	1	..	Gen. 3 (Am. only, 3). S. Am. 3; W. I. 1.	
		end.										
	Sp.	total	..	2	..	..	..	..	1	..	Sp. 3 (Am. only, 3). S. Am. 3; W. I. 1.	
		end.										

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.								In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.		
128. **Euphorbiaceæ** .. Gen. 32 (endemic 2). Sp. 368 (endemic 240).	Gen.	total	14	24	1	12	4	12	9	15	Gen. 30 (Am. only, 14). N.W. Am. 11; N.E. Am. 11; S. Am. 28; W. I. 20.	13 gen. widely; 1 Afr.; 1 Madag.; 1 Polyn. and Mascar. I.
		end.			1				1			
	Sp.	total	129	186	73	30	8	25	27	38	Sp. 128 (Am. only, 120). N.W. Am. 48; N.E. Am. 21; S. Am. 67; W. I. 46.	4 sp. widely; 2 Afr.; 1 Afr. and Mascar. 1 Galapagos.
		end.			217				12			
[27. *Balanopseæ*	......		....					....			....	1 *gen. N. Caledonia and N.E. Australia.*]
129. **Urticaceæ**...... Gen. 26 (endemic 0). Sp. 140 (endemic 97).	Gen.	total	3	19	2	8	2	11	10	16	Gen. 26 (Am. only, 11). N.W. Am. 2; N.E. Am. 7; S. Am. 24; W. I. 17.	14 gen. widely; 1 Africa.
		end.										
	Sp.	total	5	76	13	14	2	17	26	30	Sp. 43 (Am. only, 40). N.W. Am. 2; N.E. Am. 6; S. Am. 28; W. I. 23.	3 sp. widely.
		end.			63				28			
130. **Platanaceæ** .... Gen. 1 (endemic 0). Sp. 5 (endemic 4).	Gen.	total	1	1	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1.	1 gen. S. Europe; Asia.
		end.										
	Sp.	total	4	3	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1.	
		end.			4							
[28. *Leitnerieæ*	......		....					....			*Gen.* 1, *sp.* 2; 1 *Florida*, 1 *Texas.*]	
131. **Juglandeæ** .... Gen. 3 (endemic 0). Sp. 6 (endemic 4).	Gen.	total	2	2	..	..	..	..	1	..	Gen. 3 (Am. only, 1). N.W. Am. 1; N.E. Am. 2; W. I. 1.	1 gen. widely; 1 Asia.
		end.										
	Sp.	total	4	2	..	..	..	..	1	..	Sp. 2 (Am. only, 2). N.W. Am. 1; N.E. Am. 1.	
		end.			3				1			
132. **Myricaceæ** .... Gen. 1 (endemic 0). Sp. 2 (endemic 2).	Gen.	total	..	1	..	1	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	2	..	1	..	..	..	..		
		end.		2								

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.									Distribution of the Genera and Species extending beyond Mexico and Central America.	
		Mexico.									
		North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
[29. *Casuarineæ*......	......	....					....			....	1 *gen. chiefly Australian, extending to Asia, Polyn., and Mascar. Is.*]
133. **Cupuliferæ** .... Gen. 4 (endemic 0). Sp. 91 (endemic 82).	Gen. total	2	2	1	4	..	1	1	2	Gen. 4 (Am. only, 0). N.W. Am. 2; N.E. Am. 4; S. Am. 2; W. I. 1.	3 gen. widely, chiefly N. hemisphere; 1 S. Europe and W. Asia.
	Gen. end.										
	Sp. total	22	68	2	21	..	1	10	4	Sp. 9 (Am. only, 9). N.W. Am. 4; N.E. Am. 3; S. Am. 4; W. I. 1.	
	Sp. end.			68				4			
134. **Salicineæ** ...... Gen. 2 (endemic 0). Sp. 10 (endemic 4).	Gen. total	2	2	..	1	..	..	..	..	Gen. 2 (Am. only, 0). N.W. Am. 2; N.E. Am. 2; S. Am. 1; W. I. 1.	2 gen. widely, chiefly N. hemisphere.
	Gen. end.										
	Sp. total	6	7	..	1	..	..	..	..	Sp. 6 (Am. only, 5). N.W. Am. 3; N.E. Am. 3; S. Am. 1; W. I. 1.	1 sp. Central Asia.
	Sp. end.			4							
135. **Lacistemaceæ** .. Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen. total	..	1	..	1	..	1	..	1	Gen. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
	Gen. end.										
	Sp. total	..	1	..	1	..	1	..	1	Sp. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
	Sp. end.										
[30. *Empetraceæ*	......	....					....			3 *gen. N. Am.*; 1 *S. Am.*..	1 *gen. widely.*]
136. **Ceratophylleæ** .. Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen. total	..	..	1	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
	Gen. end.										
	Sp. total	..	..	1	..	..	..	..	..	Sp. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 sp. widely.
	Sp. end.										
137. **Gnetaceæ** ...... Gen. 1 (endemic 0). Sp. 3 (endemic 2).	Gen. total	1	..	..	..	..	..	..	..	Gen. 1 (Am. only, 0). N.W. Am. 1; S. Am. 1.	1 gen. widely, N. hemisphere.
	Gen. end.										
	Sp. total	3	..	..	..	..	..	..	..	Sp. 1 (Am. only, 1). N.W. Am. 1.	
	Sp. end.			2							
138. **Coniferæ** ...... Gen. 7 (endemic 0). Sp. 36 (endemic 27).	Gen. total	6	7	..	3	..	1	1	..	Gen. 7 (Am. only, 1). N.W. Am. 6; N.E. Am. 5; W. I. 2.	5 gen. widely, N. hemisphere; 1 China.
	Gen. end.										
	Sp. total	25	22	1	5	..	1	1	..	Sp. 9 (Am. only, 9). N.W. Am. 8; N.E. Am. 1.	
	Sp. end.			27							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.			Distribution of the Genera and Species in Mexico and Central America.								Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
139. **Cycadaceæ** .... Gen. 3 (endemic 2). Sp. 21 (endemic 15).	Gen.	total	..	2	1	1	1	1	..	1	Gen. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
		end.			2							
	Sp.	total	..	3	13	4	1	1	..	3	Sp. 6 (Am. only, 6). S. Am. 3; W. I. 3.	
		end.			13				1			
140. **Hydrocharideæ**.. Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	..	1	..	..	..	..	..	..	Gen. 1 (Am. only, 1). N.E. Am. 1; S. Am. 1; W. I. 1.	
		end.										
	Sp.	total	..	1	..	..	..	..	..	..	Sp. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
		end.										
141. **Burmanniaceæ**.. Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	..	..	1	..	..	..	..	..	Gen. 1 (Am. only, 1). N.E. Am. 1; S. Am. 1; W. I. 1.	
		end.										
	Sp.	total	..	..	1	..	..	..	..	..	Sp. 1 (Am. only, 1). N.E. Am. 1; S. Am. 1; W. I. 1.	
		end.										
142. **Orchideæ**: Gen. 105 (end. 14). Sp. 938 (end. 800).												
Epidendreæ.... Gen. 37 (endemic 4). Sp. 440 (end. 382).	Gen.	total	3	32	2	22	3	17	19	12	Gen. 33 (Am. only, 26). N.E. Am. 2; S. Am. 29; W. I. 25.	5 gen. widely; 1 E. Asia; 1 Galapagos.
		end.			4							
	Sp.	total	4	157	88	107	5	37	113	34	Sp. 58 (Am. only, 58). N.E. Am. 2; S. Am. 41; W. I. 40.	
		end.			247				110			
Vandeæ ...... Gen. 50 (endemic 8). Sp. 370 (end. 306).	Gen.	total	3	32	3	31	4	16	25	21	Gen. 42 (Am. only, 39). S. Am. 41; W. I. 24.	2 gen. widely; 1 Galapagos.
		end.			5				2			
	Sp.	total	3	104	85	100	4	24	66	53	Sp. 64 (Am. only, 64). S. Am. 59; W. I. 26.	
		end.			196				94			
Neottieæ ...... Gen. 15 (endemic 1). Sp. 100 (endemic 89).	Gen.	total	2	9	2	7	1	6	7	6	Gen. 14 (Am. only, 6). N.W. Am. 1; N.E. Am. 2; S. Am. 11; W. I. 11.	6 gen. widely; 1 Asia trop.; 1 Japan.
		end.							1			
	Sp.	total	3	34	18	25	1	9	16	13	Sp. 11 (Am. only, 10). N.W. Am. 1; N.E. Am. 2; S. Am. 6; W. I. 7.	1 sp. Ireland.
		end.			59				21			
Ophrydeæ .... Gen. 1 (endemic 0). Sp. 24 (endemic 19).	Gen.	total	1	1	..	1	..	1	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	2	16	1	5	..	1	2	1	Sp. 5 (Am. only, 5). N.W. Am. 1; N.E. Am. 1; S. Am. 2; W. I. 2.	
		end.			17				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.								In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.		
Cypripedieæ .. Gen. 2 (endemic 0). Sp. 4 (endemic 4).	Gen.	total	..	1	..	1	..	..	1	1	Gen. 2 (Am. only, 1). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	1	..	1	..	..	1	3		
		end.			1				3			
143. **Scitamineæ** .... Gen. 8 (endemic 0). Sp. 29 (endemic 18).	Gen.	total	..	5	1	..	..	5	1	6	Gen. 8 (Am. only, 4). S. Am. 8; W. I. 6.	1 gen. widely; 3 Africa.
		end.										
	Sp.	total	..	6	11	..	..	8	1	7	Sp. 11 (Am. only, 11). S. Am. 11; W. I. 8.	
		end.			10				8			
144. **Bromeliaceæ**.... Gen. 9 (endemic 1). Sp. 90 (endemic 72).	Gen.	total	1	5	..	3	1	4	2	6	Gen. 8 (Am. only, 8). N.E. Am. 1; S. Am. 7; W. I. 8.	
		end.		1								
	Sp.	total	3	51	13	13	1	6	3	10	Sp. 18 (Am. only, 18). N.E. Am. 2; S. Am. 13; W. I. 13.	
		end.			61				10			
145. **Hæmodoraceæ** .. Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	..	1	..	..	..	1	..	1	Gen. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
		end.										
	Sp.	total	..	1	..	..	..	1	..	1	Sp. 1 (Am. only, 1). S. Am. 1; W. I. 1.	
		end.										
146. **Irideæ** .... Gen. 11 (endemic 1). Sp. 37 (endemic 27).	Gen.	total	4	10	..	7	..	..	..	1	Gen. 10 (Am. only, 7). N.W. Am. 2; N.E. Am. 3; S. Am. 9; W. I. 2.	1 gen. widely; 1 Africa; 1 Australia.
		end.			1							
	Sp.	total	8	26	2	8	..	..	..	1	Sp. 10 (Am. only, 10). N.W. Am. 1; N.E. Am. 3; S. Am. 7; W. I. 3.	
		end.			27							
147. **Amaryllideæ** .. Gen. 14 (endemic 3). Sp. 170 (endemic 152).	Gen.	total	6	9	3	5	1	2	..	2	Gen. 11 (Am. only, 8). N.W. Am. 4; N.E. Am. 4; S. Am. 10; W. I. 6.	2 gen. widely; 1 Africa.
		end.			3							
	Sp.	total	23	30	98	10	1	2	..	2	Sp. 18 (Am. only, 18). N.W. Am. 7; N.E. Am. 3; S. Am. 9; W. I. 4.	
		end.			150				2			
[31. *Taccaceæ*........	......		....					....			1 *gen.* 3 *sp. Northern S. Am.*	1 *gen. widely*; 1 *China.*]
148. **Dioscoreaceæ** .. Gen. 1 (endemic 0). Sp. 24 (endemic 21).	Gen.	total	..	1	..	..	..	1	..	1	Gen. 1 (Am. only, 0). N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely, including 1 sp. in the Pyrenees.
		end.										
	Sp.	total	..	18	2	..	..	2	..	6	Sp. 3 (Am. only, 3). S. Am. 3; W. I. 1.	
		end.			17				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
[32. *Roxburghiaceæ* ..	......		....					....			1 *gen.* 1 *sp. S.E. States.*	3 *gen. Asia and Australia.*]
149. **Liliaceæ** ...... Gen. 17 (endemic 3). Sp. 113 (endemic 88).	Gen.	total	14	16	..	7	..	..	1	1	Gen. 14 (Am. only, 7). N.W. Am. 12; N.E. Am. 8; S. Am. 5; W. I. 3.	4 gen. widely; 3 E. Asia.
		end.			3							
	Sp	total	35	59	14	15	..	..	3	4	Sp. 25 (Am. only, 25). N.W. Am. 11; N.E. Am. 7; S. Am. 8; W. I. 6.	
		end.			84				2			
150. **Pontederiaceæ** .. Gen. 3 (endemic 0). Sp. 7 (endemic 1).	Gen.	total	1	1	1	1	..	3	..	2	Gen. 3 (Am. only, 1). N.W. Am. 1; N.E. Am. 2; S. Am. 3; W. I. 3.	1 gen. Africa; 1 Africa and Madagascar.
		end.										
	Sp.	total	3	2	1	1	..	5	..	2	Sp. 6 (Am. only, 6). N.W. Am. 1; N.E. Am. 4; S. Am. 4; W. I. 3.	
		end.			1							
[33. *Philydraceæ*	......		....					....			....	3 *gen.* 4 *sp. E. Asia, Australia, Polynesia.*]
[34. *Xyrideæ*	......		....					....			2 *gen. widely.*	1 *gen. widely in warm regions.*]
[35. *Mayaceæ*	......		....					....			1 *gen. Eastern N. & S. Am. and W. Ind.*]	
151. **Commelinaceæ** .. Gen. 12 (endemic 3). Sp. 54 (endemic 32).	Gen.	total	4	9	2	5	2	5	4	5	Gen. 9 (Am. only, 8). N.W. Am. 3; N.E. Am. 3; S. Am. 7; W. I. 8.	1 gen. widely.
		end.			3							
	Sp.	total	11	32	13	11	2	5	6	8	Sp. 22 (Am. only, 22). N.W. Am. 5; N.E. Am. 3; S. Am. 15; W. I. 9.	
		end.			30				1			
[36. *Rapateaceæ*	......		....					....			*Brazil, Guiana, and Venezuela.*]	
[37. *Flagellarieæ*	......		....					....			....	3 *gen. and about* 8 *sp.; trop. Old World.*]
152. **Juncaceæ** ...... Gen. 2 (endemic 0). Sp. 17 (endemic 3).	Gen.	total	1	2	..	1	..	..	..	..	Gen. 2 (Am. only, 0). N.W. Am. 2; N.E. Am. 2; S. Am. 2; W. I. 1.	2 gen. widely.
		end.										
	Sp.	total	9	12	1	2	..	..	..	..	Sp. 14 (Am. only, 9). N.W. Am. 7; N.E. Am. 9; S. Am. 10; W. I. 1.	3 sp. widely; 2 Europe.
		end.			3							

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
153. **Palmæ** .... Gen. 24 (endemic 6). Sp.118(endemic 113).	Gen.	total	1	12	..	6	2	9	13	12	Gen.18(Am.only,17). N.E. Am. 2; S. Am. 17; W. I. 11.	1 gen. Africa.
		end.			2				2			
	Sp.	total	2	40	10	11	2	11	37	14	Sp. 5 (Am. only, 5). S. Am. 2; W. I. 5.	
		end.			60				52			
[38. *Pandaneæ*	......		....					....			....	2 *gen.* 80 *sp. tropics of Old World.*]
154. **Cyclanthaceæ** .. Gen. 2 (endemic 0). Sp. 8 (endemic 5).	Gen.	total	..	1	..	..	..	1	1	2	Gen. 2 (Am. only, 2). S. Am. 2; W. I. 2.	
		end.										
	Sp.	total	..	1	..	..	..	1	4	3	Sp. 3 (Am. only, 3). S. Am. 2; W. I. 2.	
		end.			1				4			
155. **Typhaceæ** ...... Gen. 1 (endemic 0). Sp. 1 (endemic 0).	Gen.	total	..	1	..	1	1	1	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	1	..	1	1	1	1	1	Sp. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 sp. widely.
		end.										
156. **Aroideæ** ...... Gen. 15 (endemic 1). Sp. 115 (endemic 99).	Gen.	total	1	8	1	5	1	8	9	8	Gen. 14 (Am. only, 10). N.E. Am. 2; S. Am. 13; W. I. 9.	2 gen. widely; 2 Asia.
		end.							1			
	Sp.	total	1	32	13	16	1	10	43	14	Sp. 16 (Am. only, 15). N.E. Am. 1; S. Am. 11; W. I. 7.	1 sp. widely.
		end.			46				46			
157. **Lemnaceæ**...... Gen. 2 (endemic 0). Sp. 9 (endemic 2).	Gen.	total	..	2	..	1	..	1	..	..	Gen. 2 (Am. only, 0). N.W. Am. 1; N.E. Am. 2; S. Am. 2; W. I. 1.	2 gen. widely.
		end.										
	Sp.	total	..	8	..	1	..	1	..	..	Sp. 7 (Am. only, 2). N.W. Am. 5; N.E. Am. 7; S. Am. 7; W. I. 5.	5 sp. widely.
		end.			2							
[39. *Triurideæ*	......		....					....			2 *gen. Brazil to Venezuela.*	1 *Asia and New Guinea.*]
158. **Alismaceæ** .... Gen. 4 (endemic 0). Sp. 12 (endemic 2).	Gen.	total	..	2	1	2	..	3	..	3	Gen. 4 (Am. only, 0). N.W. Am. 3; N.E. Am. 3; S. Am. 4; W. I. 4.	3 gen. widely; 1 Africa.
		end.										
	Sp.	total	..	6	5	2	..	3	..	5	Sp. 10 (Am. only, 8). N.W. Am. 1; N.E. Am. 6; S. Am. 7; W. I. 4.	2 sp. widely.
		end.			1				1			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.			Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
			North.	South.	Uncertain.							
159. **Naiadaceæ** .... Gen. 4 (endemic 0). Sp. 12 (endemic 2).	Gen.	total	1	3	..	2	1	1	..	..	Gen. 4 (Am. only, 0). N.W. Am. 4; N.E. Am. 4; S. Am. 2; W. I. 4.	4 gen. widely.
		end.										
	Sp.	total	2	7	1	3	1	1	..	..	Sp. 10 (Am. only, 2). N.W. Am. 6; N.E. Am. 10; S. Am. 1; W. I. 1.	7 sp. widely; 1 Sandw. I.
		end.			2							
160. **Eriocauleæ** .... Gen. 1 (endemic 0). Sp. 6 (endemic 5).	Gen.	total	..	1	..	1	..	..	..	1	Gen. 1 (Am. only, 0). N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	..	5	..	1	..	..	..	1	Sp. 1 (Am. only, 1). S. Am. 1.	
		end.			4				1			
[40. *Centrolepideæ*....	......		....					....			*2 or 3 sp. extreme S. Am.*	*The rest E. Asia and Australasian.*]
[41. *Restiaceæ*	......		....					....			*1 sp. extra-trop. S. Am.*	*Numerous in S. Africa and Australia; 1 in Cochin China.*]
161. **Cyperaceæ** .... Gen. 18 (endemic 0). Sp. 218 (end. 108).	Gen.	total	8	14	..	12	2	8	9	12	Gen. 18 (Am. only, 1). N.W. Am. 8; N.E. Am. 13; S. Am. 17; W. I. 15.	14 gen. widely; 1 Africa; 1 Asia: 1 S. hemisp.
		end.										
	Sp.	total	34	145	25	26	2	24	21	40	Sp. 110 (Am. only, 68). N.W. Am. 17; N.E. Am. 37; S. Am. 90; W. I. 38.	33 sp. widely; 5 Africa; 2 Europe; 2 Asia.
		end.			89				15			
162. **Gramineæ**: Gen. 99 (endemic 6). Sp. 520 (end. 265).												
Panicaceæ.... Gen. 38 (endemic 2). Sp. 251 (end. 104).	Gen.	total	18	34	2	9	3	13	2	13	Gen. 36 (Am. only, 9). N.W. Am. 16; N.E. Am. 17; S. Am. 34; W. I. 30.	24 gen. widely: 3 Africa.
		end.			2							
	Sp.	total	68	197	25	20	4	35	3	34	Sp. 147 (Am. only, 125). N.W. Am. 18; N.E. Am. 32; S. Am. 123; W. I. 85.	19 sp. widely; 2 Africa; 1 Asia.
		end.			97				2			
Poaceæ .... Gen. 61 (endemic 4). Sp. 269 (end. 161).	Gen.	total	37	51	4	10	4	11	5	12	Gen. 57 (Am. only, 17). N.W. Am. 34; N.E. Am. 31; S. Am. 51; W. I. 22.	35 gen. widely; 3 Asia; 1 Africa: 1 Australia.
		end.			4							
	Sp.	total	116	201	31	14	5	15	6	18	Sp. 108 (Am. only, 89). N.W. Am. 44; N.E. Am. 32; S. Am. 62; W. I. 28.	17 sp. widely; 1 Africa; 1 Asia.
		end.			157				2			

Natural Orders with total numbers of Genera and Species in Mexico and Central America.	Distribution of the Genera and Species in Mexico and Central America.										Distribution of the Genera and Species extending beyond Mexico and Central America.	
			Mexico.									
			North.	South.	Uncertain.	Guatemala.	Honduras and Salvador.	Nicaragua.	Costa Rica.	Panama.	In the New World.	In the Old World and Pacific Islands.
163. **Filices** .... Gen. 48 (endemic 1). Sp. 545 (end. 159).	Gen.	total	27	41	1	42	8	30	18	25	Gen. 47 (Am. only, 3). N.W. Am. 17; N.E. Am. 22; S. Am. 44; W. I. 44.	42 gen. widely; 1 Polynesia; 1 Asia; 1 S. Afr.
		end.			1							
	Sp.	total	101	359	20	254	8	135	51	105	Sp. 386 (Am. only, 293). N.W. Am. 47; N.E. Am. 44; S. Am. 337; W. I. 260.	74 sp. widely; 10 Africa; 1 Asia; 4 Polynesia; 3 Galapagos; 1 Tris. da Cunha.
		end.			120				27			
164. **Equisetaceæ** .... Gen. 1 (endemic 0). Sp. 7 (endemic 2).	Gen.	total	1	1	..	1	..	..	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	2	5	..	1	..	..	1	1	Sp. 5 (Am. only, 3). N.W. Am. 2; N.E. Am. 1; S. Am. 4; W. I. 1.	1 sp. widely; 1 Asia.
		end.			2							
165. **Lycopodiaceæ** .. Gen. 2 (endemic 0). Sp. 13 (endemic 0).	Gen.	total	1	2	..	1	..	1	..	1	Gen. 2 (Am. only, 0). N.E. Am. 2; S. Am. 2; W. I. 1.	2 gen. widely.
		end.										
	Sp.	total	1	11	..	8	..	1	..	4	Sp. 13 (Am. only, 4). N.E. Am. 2; S. Am. 10; W. I. 10.	7 sp. widely; 1 Asia; 1 Galapagos.
		end.										
166. **Selaginellaceæ** .. Gen. 1 (endemic 0). Sp, 37 (endemic 19).	Gen.	total	1	1	..	1	..	1	1	1	Gen. 1 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 1; W. I. 1.	1 gen. widely.
		end.										
	Sp.	total	5	18	2	9	..	4	2	9	Sp. 18 (Am. only, 17). N.W. Am. 2; N.E. Am. 2; S. Am. 15; W. I. 4.	1 sp. widely.
		end.			12				5			
167. **Rhizocarpeæ**.... Gen. 3 (endemic 0). Sp. 5 (endemic 2).	Gen.	total	1	3	..	..	..	1	..	1	Gen. 3 (Am. only, 0). N.W. Am. 1; N.E. Am. 1; S. Am. 3; W. I. 3.	3 gen. widely.
		end.										
	Sp.	total	1	4	..	..	..	1	..	1	Sp. 3 (Am. only, 2). N.W. Am. 1; N.E. Am. 1; S. Am. 3; W. I. 3.	1 sp. Polynesia.
		end.			2							

The foregoing Table is an almost inexhaustible epitome of facts, for the greater part, however, in an undigested state, requiring further summarization and elucidation to bring them easily within the grasp of the mind. Perhaps the best way to effect this is by a descending process, from orders to species. Of course it is not possible to separate one grade entirely from another; but the principal facts and factors may be so classified as to give prominence to ordinal, generic, and specific distribution in a successive series of analyses. We will first give the proportions of the primary divisions of the vascular plants*, which number 12,233 species.

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* The sums of the secondary divisions, Polypetalæ, &c., are given in succeeding Tables.

Numbers and Percentages of the Mexican and Central-American species of the primary divisions of Phanerogamic Plants: *total* 11,626.

Dicotyledones	9,125 species.	78·5 per cent.
Monocotyledones	2,501 ,,	21·5 ,,
	11,626	100·0

Number and Percentage of species of Vascular Cryptogamic Plants in the total 12,233 *of Vascular Plants.*

Cryptogamæ	607 species.	5·0 per cent.
Filices alone	545 ,,	4·5 ,,

Or 95 per cent. of Phanerogams and 5 per cent. of Vascular Cryptogams.

By way of comparison it may be stated that for the whole of Australia the proportion of monocotyledons to dicotyledons is as 1 to 4·4, and for Europe as 1 to 4·8, whereas ours is about as 1 to 3·6. On the other hand, the proportion of vascular cryptogams to the phanerogamic plants in our flora is very much higher than in the Australian and the European floras.

Ordinal Distribution.

This is naturally followed by an arrangement of the orders in numerical sequence in relation to the number of species in Mexico and Central America, adding the percentages of each in the whole; the number of genera, which by no means follows that of the species; and the most striking or important features in the general distribution of the orders. Except Europe, Australia is the only large country the flora of which has been sufficiently elaborated to enable us to institute comparisons in the sequence of the predominance of the whole of the orders; and the figures in brackets preceding the orders are extracted from one of Baron Mueller's latest contributions to Australian botanical geography*. Many comparisons with other countries besides Australia are made in the discussion on the general distribution of the larger natural orders some pages further on. Where, as in the distribution of the Palmæ, the phrase temperate latitudes is employed, some members of the order inhabit altitudinal temperate regions within the tropics.

All the orders represented in Australia by an equal number of species are indicated as occupying the same position in the sequence, otherwise some of them would be removed a considerable distance from their true positions, because, in one instance, as many as fourteen orders are represented by the same number of species.

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* 'Systematic Census of Australian Plants.' Third Annual Supplement, 1886, p. 6.

Sequence of the Natural Orders of the Flora of Mexico and Central America, according to their predominance in Species, with the relative percentages of the Phanerogamic Orders.

Position in the Australian Flora.	Orders.	Species.		Number of Genera.	Distribution of the Orders.
		Number.	Percentage.		
(4)	1. Compositæ	1518	13·0	215	Universal.
(1)	2. Leguminosæ	944	8·1	110	„ except Oceanic Islands.
(7)	3. Orchideæ	938	8·0	105	„ „ „ „
(11)	4. Filices*	545	4·5	48	„
(6)	5. Gramineæ	520	4·5	99	„
	6. Cactaceæ	500	4·3	11	America, except *Rhipsalis.*
(14)	7. Rubiaceæ	385	3·3	74	Universal, except coldest regions.
(9)	8. Euphorbiaceæ	368	3·2	32	„ „ „ „
(15)	9. Labiatæ	250	2·2	29	„ rare in „ „
(27)	10. Solanaceæ	230	2·0	26	Tropical and temperate regions.
(5)	11. Cyperaceæ	218	1·9	18	Universal.
(89)	12. Piperaceæ †	214	1·8	3	Tropics, rare in temperate regions.
(18)	13. Malvaceæ	182	1·6	26	Universal, except coldest regions.
(30)	14. Scrophularineæ	170	1·5	42	„
(26)	15. Amaryllideæ	170	1·5	14	Temperate and tropical regions.
(51)	16. Acanthaceæ	165	1·4	38	Tropics, rare in temperate regions.
(35)	17. Asclepiadeæ	153	1·3	21	Tropics and temperate S. Africa chiefly.
(121)	18. Gesneraceæ	144	1·2	23	„ rare in temperate latitudes.
(32)	19. Convolvulaceæ	141	1·2	9	Universal, though rare in the colder regions.
(33)	20. Urticaceæ	140	1·2	26	Tropical and temperate regions.
(103)	21. Melastomaceæ	139	1·2	29	„ „ subtropical, chiefly American.
(38)	22. Boragineæ	120	1·0	17	Universal, except coldest regions.
(55)	23. Palmæ	118	1·0	24	Tropics, rare in temperate latitudes.
(89)	24. Aroideæ	115	0·98	15	Universal, except coldest regions.
(13)	25. Liliaceæ	113	0·97	17	Temperate and subtropical, rare in the hottest and coldest regions.
(125)	26. Malpighiaceæ	104	0·89	17	Tropics, rare in temperate regions.
(73)	27. Rosaceæ	104	0·89	25	Universal, but chiefly temperate.
(108)	28. Onagrarieæ	97	0·83	14	Temperate regions generally, but chiefly America.
(20)	29. Sapindaceæ	93	0·79	17	Tropical and temperate regions.
(63)	30. Cucurbitaceæ	93	0·79	24	Tropics, rare in temperate regions.
(112)	31. Cupuliferæ	91	0·78	4	Temperate regions, rare in frigid.
	32. Bromeliaceæ	90	0·77	9	America only.
(29)	33. Verbenaceæ	87	0·75	17	Tropical and temperate regions.
(19)	34. Umbelliferæ	85	0·73	22	Temperate and subtropical, rare in frigid regions.
(73)	35. Lythrarieæ	82	0·71	9	Wide, except coldest regions.
(40)	36. Apocynaceæ	78	0·67	23	Tropics, rare in temperate regions.
(37)	37. Cruciferæ	76	0·65	20	Temperate and frigid regions generally.
‡	38. Begoniaceæ	70	0·60	1	Tropics, except Australia, rare in E. temperate Asia.
(21)	39. Amarantaceæ	68	0·58	20	Tropics, rarer in temperate regions.
(55)	40. Loranthaceæ	65	0·56	5	„ „ „ „
(46)	41. Campanulaceæ	63	0·54	10	Universal, though rare in frigid and tropical regions.

* The percentage of Filices is calculated from the whole number of vascular species =12233.

† This is probably far from the true position of this order, as very slightly different forms have been assigned the rank of species in the latest monograph.

‡ Leaves of a plant, probably a *Begonia*, have been collected in North-western Australia.

Position in the Australian Flora.	Orders.	Species.		Number of Genera.	Distribution of the Orders.
		Number.	Percentage.		
(103)	42. Crassulaceæ	62	0·53	3	Chiefly temperate and subtropical regions.
(62)	43. Gentianaceæ	62	0·53	12	Universal, rarer in tropical regions.
(49)	44. Polygalaceæ	59	0·50	4	Temperate and tropical regions.
(57)	45. Polygonaceæ	59	0·50	11	Universal.
(2)	46. Myrtaceæ	58	0·50	12	Tropical and temperate, rare in N. temp. reg.
(108)	47. Ericaceæ	58	0·50	9	Very wide, most numerous S. Africa.
(103)	48. Passifloreæ	56	0·48	3	Tropics, rare in temperate regions.
(108)	49. Nyctagineæ	54	0·46	14	Tropical and subtropical, very rare in Africa.
(68)	50. Commelinaceæ	54	0·46	12	Tropics, rare in temp., none in Europe.
(97)	51. Bignoniaceæ	51	0·44	14	,, ,, ,, ,, or in N. Zeal.
(60)	52. Caryophyllaceæ	50	0·43	10	Temp. and frigid regions generally.
(73)	53. Ranunculaceæ	49	0·42	7	Universal, chiefly temperate regions.
(97)	54. Geraniaceæ	49	0·42	5	Temperate and subtropical, especially S. Africa.
(15)	55. Sterculiaceæ	48	0·41	15	Tropical and subtropical, very rare in temperate.
(86)	56. Myrsineæ	46	0·40	7	,, ,, ,, ,, Africa.
(36)	57. Tiliaceæ	44	0·37	11	Almost universal, except frigid regions.
(25)	58. Rhamnaceæ	42	0·36	10	Tropics, rarer in temperate regions.
(60)	59. Capparideæ	41	0·35	10	,, and subtropics.
(79)	60. Celastrineæ	41	0·35	12	Almost universal, except frigid regions.
(89)	61. Anacardiaceæ	40	0·34	11	Tropical and subtropical, very rare in temperate regions.
(85)	62. Violaceæ	37	0·32	6	Universal almost, except frigid regions.
(57)	63. Irideæ	37	0·32	11	Tropical and temperate, especially S. Africa and Mediterranean region.
*	64. Selaginellaceæ	37	0·32	1	Tropical zone, rarer in temperate, very rare in frigid.
(135)	65. Ternstrœmiaceæ	36	0·30	10	Tropics, rarer N. temp., very rare S. temp. reg.
(39)	66. Loganiaceæ	36	0·30	7	Tropical, rare in temperate, none in Europe and Central Asia.
(44)	67. Laurineæ	36	0·30	9	Tropical, especially S. America, rare in temperate regions.
(52)	68. Coniferæ	36	0·30	7	Temperate, rarer in tropical and frigid regions.
(125)	69. Caprifoliaceæ	34†	....	6	Temperate, chiefly north, rare in tropics, absent in tropical and S. Africa.
(125)	70. Hydrophyllaceæ	32	....	5	Widely scattered, but mainly temperate N.W. America.
(125)	71. Burseraceæ	31	....	2	Tropics, very rare in temperate regions.
	72. Polemoniaceæ	31	....	7	Temperate regions of America, very rare in temperate Europe and Asia.
(65)	73. Araliaceæ	30	....	6	Tropical zone, rarer in temperate, none in frigid.
‡	74. Vacciniaceæ	30	....	4	Temperate and frigid, including tropical countries, very rare in S. hemisphere.
(108)	75. Aristolochiaceæ	30	....	1	Tropics, rarer in temperate regions, especially S.
(73)	76. Anonaceæ	29		8	Tropics, rare in temperate regions.
(87)	77. Scitamineæ	29	....	8	Tropics, very rare in temperate regions.
(97)	78. Simarubeæ	28	....	10	,, ,, ,, ,,
(17)	79. Chenopodiaceæ	28	....	8	Universal in subtropical and temperate regions.
(12)	80. Rutaceæ	26	....	14	Tropical and subtropical, rare in temperate regions.
(125)	81. Guttiferæ	24	....	7	Tropical and subtropical, chiefly America and Asia.
(44)	82. Meliaceæ	24	....	5	Tropical and subtropical, very rare in temperate, none in Europe.

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* Combined with Lycopodiaceæ by Mueller.

† It was not considered worth while to calculate the percentages beyond this.

‡ A monotypic somewhat anomalous Australian genus of this Order is referred by Mueller to the Ericaceæ.

Position in the Australian Flora.	Orders.	Number of Species.	Number of Genera.	Distribution of the Orders.
	83. Valerianaceæ	24	2	North temperate, subtropical, and Andes.
(112)	84. Dioscoreaceæ	24	1	Tropics, rare in temperate regions; one in Pyrenees.
(71)	85. Ampelideæ	22	1	Tropics, rarer in temperate regions.
(112)	86. Linaceæ	21	2	Tropics and N. temperate regions, rare S. temp.
(83)	87. Cycadaceæ	21	3	„ rare in temperate regions.
(135)	88. Hypericineæ	20	3	Widely in temperate and subtropical regions.
(54)	89. Combretaceæ	20	7	Tropics, rarer in subtropical regions.
(46)	90. Saxifragaceæ	19	9	Temperate and frigid, rare in tropical regions.
(112)	91. Samydaceæ	18	4	Tropics, rarer in subtropical regions.
	92. Loasaceæ	18	7	America, except *Kissenia* in Africa and Arabia.
(57)	93. Lentibularieæ	18	2	Widely diffused in temperate and tropical regions.
(22)	94. Dilleniaceæ	17	4	Tropics and temperate Australia, very rare elsewhere.
(79)	95. Juncaceæ	17	2	Universal, chiefly temperate and frigid regions.
(68)	96. Sapotaceæ	16	5	Tropics generally, very rare in temperate regions.
(66)	97. Oleaceæ	16	3	Widely spread in temperate and tropical regions.
	98. Berberideæ	15	1	Temperate regions, except S. Africa and Australasia.
(96)	99. Bixineæ	15	6	Tropics, very rare in temperate regions.
(49)	100. Portulaceæ	15	6	Widely scattered, but chiefly S. hemisphere.
(125)	101. Styraceæ	14	2	Widely in tropical and temperate regions, except Africa.
(70)	102. Lycopodiaceæ	13	2	Generally spread, except in dry regions.
(103)	103. Alismaceæ	12	4	Universal, except frigid regions.
(48)	104. Naiadeæ	12	4	„ „ „ „
(66)	105. Zygophylleæ	11	5	Tropical and subtropical, rarer in S. hemisphere.
(135)	106. Podostemaceæ	11	4	Tropics, very rare in Australia; few S. Africa and N. America.
	107. Cistineæ	10	2	N. temperate, chiefly Mediterranean, very few in S. America.
(135)	108. Cornaceæ	10	2	General, except frigid regions.
(87)	109. Phytolaccaceæ	10	8	Tropical and subtropical, very rare in temperate regions.
(82*)	110. Monimiaceæ	10	2	Thinly and widely scattered in tropical and subtropical regions.
	111. Salicineæ	10	2	N. temperate and frigid regions, rare in South, none in Australasia.
(125)	112. Connaraceæ	9	3	Tropics, except Australia.
(112)	113. Plantagineæ	9	1	Generally spread in temperate and subtropical regions.
(103)	114. Lemnaceæ	9	2	Universal, except frigid regions.
(78)	115. Menispermaceæ	8	4	Tropics, very rare in temperate regions.
(112)	116. Nymphæaceæ	8	3	Almost universal, except frigid regions.
(135)	117. Papaveraceæ	8	4	Chiefly N. subtropical, temperate, and frigid, especially west N. America.
(34)	118. Halorageæ	8	4	Almost universal, except frigid regions.
(135)	119. Orobanchaceæ	8	3	Temperate regions, including tropical countries, rare in S. hemisphere.
	120. Cyclanthaceæ	8	2	Tropical America.
(81)	121. Olacineæ	7	2	Tropical and subtropical, very rare in temperate S. Africa and Australia.
(125)	122. Ilicineæ	7	1	Tropical Asia and America, and N. temperate regions.
	123. Turneraceæ	7	3	America and African region.
(82)	124. Ebenaceæ	7	2	Tropical and subtropical, very rare in temperate regions.
†	125. Illecebraceæ	7	4	Generally diffused, except frigid regions.
(135)	126. Pontederiaceæ	7	3	Tropics, rare in temperate regions.
	127. Equisetaceæ	7	1	Widely spread, but not in Australasia and Polynesia.
(112)	128. Magnoliaceæ	6	3	Widely in temperate and tropical regions, though none in Europe and Africa.

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* This order appears to have been accidentally omitted by Mueller.

† Mueller refers the few Australian members of this order to Caryophyllaceæ and Chenopodiaceæ.

Position in the Australian Flora.	Orders.	Number of Species.	Number of Genera.	Distribution of the Orders.
(135)	129. Ochnaceæ	6	2	Tropics, very rare in subtropical regions.
(52)	130. Ficoideæ	6	3	Tropical and subtropical, and numerous in S. Africa.
(121)	131. Pedalineæ	6	1	,, ,, ,, chiefly Africa.
	132. Juglandaceæ	6	3	North temperate zone and countries of tropical Asia and Central America.
(71)	133. Eriocauleæ	6	1	Widely spread, most numerous in S. America.
	134. Vochysiaceæ	5	2	Tropical and subtropical America.
	135. Sabiaceæ	5	1	,, ,, ,, chiefly north; not in Australasia.
(97)	136. Primulaceæ	5	4	Very widely spread, chiefly N. temperate and frigid.
(3)	137. Proteaceæ	5	1	Australasia, S. Africa; few S. America; very few tropical Africa and Asia, and northward to Japan.
	138. Platanaceæ	5	1	Temperate and subtropical Asia, E. Europe, and N. America.
(89)	139. Rhizocarpeæ	5	3	Generally spread, except frigid regions.
	140. Lennoaceæ	4	2	Southern California.
(112)	141. Plumbagineæ	4	2	Very widely, especially in maritime and sandy districts.
(31)	142. Thymelæaceæ	4	1	Widely spread, chiefly in temperate and subtropical regions.
	143. Tamariscineæ	3	1	Remainder N. temperate and subtropical of Old World and S. Africa.
(135)	144. Hamamelideæ	3	1	N. temperate and subtropical, and S. Africa.
	145. Monotropeæ	3	3	N. temperate zone, southward in America to Colombia.
	146. Chloranthaceæ	3	1	Tropical and E. Asia; Tropical America, Polynesia, and N. Zealand.
(135)	147. Myristicaceæ	3	1	Tropics, chiefly Asia and America.
(135)	148. Balanophoreæ	3	3	,, rare in Mediterranean, S. Africa, and N. Zealand.
	149. Gnetaceæ	3	1	,, ,, temperate regions, absent in Australasia.
(97)	150. Rhizophoreæ	2	2	Tropics, chiefly maritime districts.
	151. Cytineæ	2	1	Warm regions of Asia, Africa, America, and Europe.
	152. Myricaceæ	2	1	Widely spread in temperate and tropical regions; none in Australasia.
	153. Fumariaceæ	1	1	N. temperate and subtropical regions, and S. Africa.
	154. Resedaceæ	1	1	* N. temperate and subtropical regions of Old World and S. Africa.
(97)	155. Frankeniaceæ	1	1	Widely diffused in maritime districts.
(112)	156. Elatinaceæ	1	1	,, ,, temperate and tropical regions.
	157. Chailletiaceæ	1	1	Tropics, except Australia, one S. Africa.
	158. Coriarieæ	1	1	Widely spread in temperate regions, except S. Africa and Australia.
	159. Datiscaceæ	1	1	S.E. Europe, Asia, California.
(10)	160. Goodenovieæ	1	1	Australasia, and a very few littoral in tropics.
(42)	161. Santalaceæ	1	1	Widely spread in temperate and tropical regions.
	162. Lacistemaceæ	1	1	Tropical America.
(149†)	163. Ceratophylleæ	1	1	Cosmopolitan, except frigid regions.
(94)	164. Hydrocharideæ	1	1	Widely, though thinly scattered in temperate and tropical regions.
(125)	165. Burmanniaceæ	1	1	Thinly spread over the tropics and E. temperate N. America.
‡	166. Hæmodoraceæ	1	1	Widely spread, chiefly Australia and S. Africa.
(125)	167. Typhaceæ	1	1	Generally dispersed, except frigid regions; rare in tropics.

The comparisons afforded by the figures, borrowed from Mueller, of the vegetation of two such distant and dissimilar countries as Australia and Mexico are extremely in-

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* The one species in North Mexico and California is very doubtfully native.

† Combined with Halorageæ by Mueller.

‡ Treated as a tribe of the Amaryllideæ by Mueller.

teresting, not alone on account of the striking contrasts they bring out, but also as showing that the general composition of the vegetation is almost equally varied in the two regions. The orders without bracketed numbers before them, in the preceding Table, where not otherwise explained, are not represented in Australia; but after adding five that are treated as suborders or tribes of others by Mueller, and one accidentally omitted by him, the total in Australia is 154 against our 167. Twenty-nine of the Mexican orders are not represented in Australia, as opposed to sixteen in which the condition is reversed. Grisebach's materials gave the following sequence in the West Indies:—Leguminosæ, Orchideæ, Rubiaceæ, Compositæ, Euphorbiaceæ, Gramineæ, Melastomaceæ, Cyperaceæ, Urticaceæ, Myrtaceæ, Solanaceæ, and Convolvulaceæ. Apart from the Cactaceæ the sequence of the first twenty-five orders in Mexico and Central America combined approaches closely to that of the same orders in the flora of the whole world, as may be seen from the following list of the twenty-five largest orders:—Compositæ, Leguminosæ, Orchideæ, Rubiaceæ, Gramineæ, Euphorbiaceæ, Labiatæ, Cyperaceæ, Liliaceæ, Scrophularineæ, Myrtaceæ, Melastomaceæ, Urticaceæ, Acanthaceæ, Asclepiadeæ, Umbelliferæ, Solanaceæ, Cruciferæ, Boragineæ, Palmæ, Campanulaceæ, Ericaceæ, Cactaceæ, Rosaceæ, Piperaceæ. According to the roughly-estimated numbers of species in Bentham and Hooker's 'Genera Plantarum,' the first of these orders comprises about 10,000 species, and the last about 1000. Turning to the first twenty-five orders in Australia we find that at least one-third of them are not of general distribution, and thirteen of them are different from those just named. The Australian sequence of the first twenty-five is:—1, Leguminosæ; 2, Myrtaceæ; 3, Proteaceæ; 4, Compositæ; 5, Cyperaceæ; 6, Gramineæ; 7, Orchideæ; 8, Epacrideæ; 9, Euphorbiaceæ; 10, Goodeniaceæ; 11, Filices; 12, Rutaceæ; 13, Liliaceæ; 14, Rubiaceæ; 15, Labiatæ; 16, Sterculiaceæ; 17, Chenopodiaceæ; 18, Malvaceæ; 19, Umbelliferæ; 20, Sapindaceæ; 21, Amarantaceæ; 22, Dilleniaceæ; 23, Stylideæ; 24, Restiaceæ; 25, Rhamnaceæ. Similar divergences are met with on carrying the comparison further; and we perceive that, notwithstanding the great richness and diversity of the Mexican flora, it is by no means so highly specialized as the Australian; yet more so than is apparent from this comparison, because the characteristically Mexican physiognomical types do not happen to run so much in orders as in genera. This obtains, though of course not to the same extent, even when the flora of Central America is left out of consideration. Some further observations on this and cognate points will be found in the discussion of the endemic element. The comparatively low position of the Compositæ in the Australian flora is one of its most remarkable features. In all the five floral regions of extra-tropical South Africa, proposed by Bolus*, Compositæ predominate, and in some of them very largely; reaching as high as 23·6 per cent. in the "Composite Region." In other respects, taking area for area, the South-African flora is as rich and varied as the Australian; several of the highly-developed orders, as the Proteaceæ, Restiaceæ, and Rutaceæ, being the same in South-western Africa and Western Australia; while each exhibits a number of genera specially characteristic of the region. But it would be going beyond our line to pursue these contrasts further here.

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* Sketch of the Flora of South Africa, in the official Handbook of the Cape of Good Hope for the Colonial and Indian Exhibition, 1886.

A few words on the distribution of the orders not known to occur within our limits may close this part.

Distribution of the Natural Orders of Flowering-Plants not known to be represented either in Mexico or Central America.

Following Bentham and Hooker's 'Genera Plantarum,' there are 202 natural orders of flowering-plants, and taking the Fumariaceæ as an order distinct from the Papaveraceæ, there are 203, of which 162 are represented within the limits of this work. Of the remaining forty-one orders, one, the Leitnerieæ, is restricted to America north of Mexico, that is to say to Texas and Florida; three, the Calycereæ, Columelliaceæ, and Rapateaceæ, are peculiar to South America, and four, the Sarraceniaceæ, Canellaceæ, Cyrillaceæ, and Mayaceæ, are confined to North and South America and the West Indies. Further, the Humiriaceæ, with the exception of the West-African monotypic *Aubrya*, are South-American and West-Indian; the order Batideæ consisting of only one species, and the only order so limited, is tropical American, and is also found in the Sandwich Islands, where, however, it may have been introduced, as it is a littoral shrub; the Calycanthaceæ and the Triurideæ are Asiatic and American; and, finally, twelve other orders are more widely spread, including America. Several of the last category offer interesting and curious facts in the present distribution of plants. Thus, of the Restiaceæ, so numerous in Australia and South Africa, only one species of *Leptocarpus* inhabits Chili; of the otherwise Australasian, Malayan, and Polynesian Epacrideæ, the monotypic genus *Lebetanthus* is endemic in Fuegia; of the chiefly Australasian Myoporineæ there is a monotypic genus (*Bontia*) in the West Indies; of the almost exclusively Australasian Centrolepideæ, one species of *Gaimardia* is a native of the extreme south of America; of the Taccaceæ, widely spread in the Old World and Pacific Islands, three very distinct species are peculiar to tropical America; and of the three genera of the Empetraceæ, all are found in North America, and one recurs in the Andes, extends to the extreme south of America, and is also common in Tristan da Cunha. Equally interesting particulars of the distribution of the rest of the orders might be given did space permit. In all probability several of the natural orders named exist either in Mexico or in Central America, as vast areas are still comparatively unexplored. This may be expected, especially of those orders of wide distribution

Total number of Genera in Mexico and Central America, and number in each division.

	Total in Mexico and Central America.	Total Endemic.	North Mexico.	South Mexico.	Mexico, uncertain.	Guatemala.	Honduras and Salvador.	Endemic in Mexico, Guatemala, and Honduras.	Nicaragua.	Costa Rica.	Panama.	Endemic in Nicaragua, Costa Rica, and Panama.
POLYPETALÆ .... (72 Nat. Orders.)	611	58	280	450	22	217	32	52	148	117	268	1
GAMOPETALÆ .... (36 Nat. Orders.)	648	94	341	456	35	214	53	73	150	177	202	4
INCOMPLETÆ .... (28 Nat. Orders.)	169	7	71	120	11	57	13	5	47	42	67	1
MONOCOTYLEDONES ...... (23 Nat. Orders.)	355	37	106	264	23	140	26	27	117	101	130	7
GYMNOSPERMÆ .... (3 Nat. Orders.)	11	2	7	9	1	4	1	2	2	1	1	0
Totals of Phanerogamæ. (162 Nat. Orders.)	**1794**	**198**	**805**	**1299**	**92**	**632**	**125**	**159**	**464**	**438**	**668**	**13**
CRYPTOGAMÆ VASCULARES. (5 Nat. Orders).	55	1	31	48	1	45	8	1	33	20	29	0
Grand Totals.......... (167 Nat. Orders.)	**1849**	**199**	**836**	**1347**	**93**	**677**	**133**	**160**	**497**	**458**	**697**	**13**

Number of Mexican and Central-American Genera extending to other Regions.

	Total.	Restricted to America.	Extending to other parts of America.				Extending to the Old World and Pacific Islands.										
			North-west America.	North-east America.	South America.	West Indies.	Widely.	Europe.	Mediterranean region.	Asia.	East Asia.	Africa and Mascarene I.	Australasia.	Antarctic region.	Polynesia.	Sandwich Islands.	Galapagos Islands.
Polypetalæ .... (72 Nat. Orders.)	553	261	226	181	445	310	218	....	4	23	4	31	7	2	....	1	7
Gamopetalæ .... (36 Nat. Orders.)	553	341	253	216	428	273	157	1	3	7	10	20	8	....	3	1	3
Incompletæ .... (28 Nat. Orders.)	161	80	58	52	128	95	64	1	3	3	....	8	3	....	2	....	1
Monocotyledones ...... (23 Nat. Orders.)	318	174	94	108	282	202	114	....	....	7	5	14	2	....	....	....	2
Gymnospermæ .... (3 Nat. Orders.)	9	2	7	5	2	3	6	....	....	....	1	....	....	....	....	....	....
Totals of Phanerogamæ . (162 Orders.)	**1594**	**858**	**638**	**562**	**1285**	**883**	**559**	**2**	**10**	**40**	**20**	**73**	**20**	**2**	**5**	**2**	**13**
Cryptogamæ Vasculares . (5 Nat. Orders.)	54	3	20	27	51	50	50	....	....	....	....	1	....	....	....	....	....
Grand Totals .... (167 Nat. Orde	**1648**	**861**	**658**	**589**	**1336**	**933**	**609**	**2**	**10**	**40**	**20**	**74**	**20**	**2**	**5**	**2**	**13**

as well as of those peculiar American orders, which are found both north and south of the limits of this work.

Altogether, it will be seen, 185 of the 203 natural orders of flowering plants are represented in America, leaving a residue of only eighteen. Six of these are widely spread in the Old World, though mostly characteristic of certain regions; thus the Nepenthaceæ of the Malay Archipelago and the Pittosporeæ of Australia. Three orders are common to Asia and Africa; two to Asia, Australasia, and Polynesia; and one to Australasia and Polynesia. Two are peculiar to Australasia, two to South Africa, and one, the Chlænaceæ, to Madagascar. Recent explorations in Madagascar have considerably augmented this remarkable order, eight genera and at least twenty-five species being now known. The only orders not represented in America of great economic importance are the Dipterocarpeæ and the Pandaneæ, the former chiefly inhabiting tropical Asia, and the latter specially characteristic of the Mascarene and Malay islands. *Pandanus utilis* is cultivated in the West Indies. The Cyclanthaceæ are the New-World counterparts of the Pandaneæ. It should be mentioned that a considerable number of distinct tribes and suborders, regarded as independent orders by some botanists, are of much narrower distribution.

Generic Distribution.

The total number of Phanerogamic genera known to inhabit Mexico and Central America is 1794, and the number of species approximately 11,626, or nearly six to a genus. Their distribution is set forth numerically in the accompanying Tables, which are explained in the succeeding paragraphs.

It will be convenient to discuss most of the details of the distribution of the genera in connection with the species, as a great deal of repetition will thereby be avoided. The first of the two foregoing Tables (pp. 208–9) shows the distribution of the genera within Mexico and Central America, so far as it is known at present, and requires very little explanation beyond that at p. 169 relating to the larger Table, from which these were reduced. What particularly strikes one are the comparatively small numbers from most of the southern districts—evidence of how much remains to be done. Indeed the only area that has been anything approaching fully investigated is South Mexico; and North Mexico comes next. As mentioned elsewhere, the numbers in the "uncertain" column may well be added to the South-Mexican, as it is now certain that with very few exceptions they are from that region. Notwithstanding the fact that a very large extent of the country is still almost wholly unexplored botanically, it is not probable that future labours will bring any great accession to the present total number of genera for the whole country, because the number of quite local genera is exceedingly small, as may be gathered from the very low proportion of endemic genera in Central America. Collectively, 23·6 per cent. of the genera described in Bentham and Hooker's 'Genera Plantarum' are found within our limits, and 18·2 per cent. in South Mexico.

The numbers and percentages of the endemic and non-endemic genera, together with their proportional distribution is given below. The second Table exhibits the generic extension to other parts of America in the left-hand section, and countries beyond America in the right-hand section. Those genera included in the column headed "widely" are not repeated in any of the other columns to the right. That is to say, of the 292 polypetalous genera which extend beyond America, 218 are widely diffused, leaving seventy-four that extend to one, or rarely two, of the other countries or regions named in the Table.

Percentages of the Endemic Generic Element.

Out of a total of 1849 genera of vascular plants in Mexico and Central America, only 199, or about 10·8 per cent., are endemic, which is very low as compared with extra-tropical South Africa and Australia, the only large countries of which there are available data. Even taking Mexico alone, which is generally regarded as having a highly specialized flora, the endemic genera do not amount to 12 per cent. Going still farther, and including those genera common to Mexico and western North America only, the majority of which may legitimately be reckoned as forming part of the same floral region, in the same sense that the proportions for the whole of Australia and the whole of extra-tropical South Africa are used in comparison, the percentage would probably not exceed 20. Engler*, to whom we are indebted for particulars concerning the genera of Australia, makes the total of vascular plants 1393, as he takes a more restricted view than Mueller, and one more in accord with Bentham and Hooker's 'Genera Plantarum;' and 425 of them, or 30·5 per cent., are endemic, being nearly three times as high as in Mexico. In extra-tropical South Africa the proportion is even higher. Bolus† estimates the total number of genera of flowering-plants at 1255, and the endemic at 446, which is equal to 35·5 per cent. Taken separately the flora of West Australia would afford similar results, if not a still higher proportion of endemic genera. The proportional distribution of the endemic genera is as here given:—

Number, Percentages, and Distribution of the Endemic Genera of Phanerogamic Plants.

Total endemic	198	11·0 per cent. of 1794, total number.
Endemic in north area .	159	80·3 per cent. of 198, total endemic.
" in south area .	13	6·6 " " " " "
" in combined areas.	26	13·1 " " " " "
	198	100·0

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* Versuch einer Entwickelungsgeschichte der extratropischen Florengebiete der südlichen Hemisphäre, p. 34.

† 'Sketch of the Flora of South Africa,' p 2.

Percentages and Distribution of the Non-endemic Genera of Phanerogamic Plants.

Extending to other parts of America	1594*	88·9 per cent. of 1794, total number.
Restricted to America . .	858	53·7 per cent. of 1596, total non-endemic.
Extending to Old World and Pacific Islands . .	738*	46·3 „ „ „ „
	1596	100·0

Genera numerous in Species.

Although we have no genera so numerous in species as *Mesembryanthemum* (about 300 species) and *Erica* (about 500 species) in South Africa, and *Acacia* (320 species) in Australia, yet a relatively small number of genera contribute a large proportion of the species. How far the vegetation is composed of these genera is an entirely distinct question, and one not so easily answered, because we have little information respecting the degree of commonness of a great majority of the species. It is well known that pines, oaks, ferns, and various other plants grow gregariously and characterize so many different regions; and certain species, as we learn from the narratives of various travellers, are exceedingly common in certain localities. Some idea, too, of the prevailing species may be obtained from their frequency in the collections from distant districts; but we know next to nothing of the degree of rarity of the rarer species. These observations are intended to warn the reader against the assumption that the accompanying list of large genera was drawn up specially to give an idea of the composition of the vegetation. It may be examined, however, both in relation to numerical preponderance of species of a few generic types and their degree of domination in the composition of the vegetation.

Genera containing Twenty-five Species and upwards.

	Number.	Endemic.
Mamillaria	240	224
Epidendrum	182	154
Eupatorium	149	132
Salvia	134	116
Piper	126	121
Agave	126	104
Euphorbia	111	74
Echinocactus	110	95
Carried forward .	1178	1020
Brought forward .	1178	1020
Polypodium	109	44
Solanum	101	69
Dalea	98	69
Senecio	98	93
Ipomœa	88	81
Peperomia	87	63
Quercus	86	46
Carried forward .	1845	1485

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* Two of the Old-World genera, *Erblichia* and *Abelia*, are only known to inhabit America within our limits; therefore 11·0, 88·9 and ·1=100.

	Number.	Endemic.
Brought forward .	1845	1485
Desmodium	85	68
Cyperus	77	37
Oncidium	72	54
Panicum	72	29
Begonia	71	67
Cassia	69	19
Stevia	68	62
Cereus	67	53
Croton	64	44
Acalypha	64	48
Cuphea	63	57
Asplenium	63	20
Pleurothallis	56	48
Opuntia	55	42
Vernonia	51	43
Tillandsia	51	40
Passiflora	49	18
Mimosa	48	32
Psychotria	48	38
Baccharis	48	39
Ficus	46	42
Miconia	43	19
Gonolobus	43	40
Chamædorea	43	43
Anthurium	43	38
Asclepias	42	27
Odontoglossum . . .	42	42
Paspalum	42	17
Acrostichum	42	10
Verbesina	41	35
Maxillaria	41	34
Nephrodium	39	14
Acacia	38	21
Brickellia	37	28
Loranthus	37	30
Carried forward .	3705	2783

		Number.	Endemic.
Brought forward .		3705	2783
Selaginella		37	19
Cotyledon		36	34
Muehlenbergia . . .		35	20
Serjania		34	28
Eryngium . . .		34	28
Spiranthes		34	31
Abutilon		32	16
Oxalis		32	23
Gnaphalium		32	27
Cestrum		32	27
Columnea		32	31
Hyptis		32	15
Sida		31	11
Phaseolus		31	20
Lobelia		31	24
Smilax		31	20
Carex		31	20
Andropogon		31	13
Bursera		30	27
Aristolochia		30	24
Adiantum		30	8
Inga		29	14
Zexmenia		29	28
Astragalus		28	21
Œnothera		28	16
Erigeron		28	23
Cordia		28	13
Aster		27	18
Bidens		27	19
Bouvardia		26	25
Perezia		26	23
Castilleja		26	17
Crotalaria		25	18
Calliandra		25	16
Sedum		25	24
Totals . .	85	4760	3524

The eighty-five genera in the foregoing list constitute about 4·6 per cent. of the total in Mexico and Central America, and they comprise 39 per cent. of the species. There is a very great disparity in the proportions, and it is evident that most of these genera abound in individuals as well as species, and constitute a large part of the vegetation, some in one region and some in another. Yet when it is remembered that such important types as pines, tree-ferns, myrtles, laurels, mangroves, nearly all the genera of palms, all the genera of the *Yucca* type except *Agave*, and a host of other prominent things do not come under consideration by reason of their numerical inferiority in species, the part the large genera play will be more accurately appreciated. Indeed, so far as mere domination is concerned, it is certain that several of the genera of a single species surpass others of a hundred species, either in consequence of their size or prodigious individual development.

Monotypic Genera.

We pass from the strongly diversified genera to genera of a single species. Some of these might, perhaps, with equal justice rank as anomalous species of other genera; but, as a whole, they consist of distinct isolated forms whose origin and isolation may be due to a variety of causes and accidents; but we do not propose entering into any speculations on this subject here. It would fill too much space to enumerate the genera; but the numbers in each order, with the orders systematically arranged, will serve both as an index to them and present them to the eye in a more intelligible manner than a sum total would do.

Number of Monotypic Genera in each Natural Order and their Distribution.

Orders.	Total.	Endemic.	Extending to other parts of America.	Extending beyond America.
Anonaceæ	1	1		
Menispermaceæ	1	1		
Nymphæaceæ	1	0	1 widely.	1
Papaveraceæ	1	1		
Cruciferæ	3	1	2 N.W. & N.E.	
Capparideæ	2	0	1 N.W. & S.; and 1 S. & W. I.	
Bixineæ	1	0	1 S.	
Caryophyllaceæ	1	1		
Portulaceæ	2	0	1 N.W.; 1 widely.	1
Ternstrœmiaceæ	1	0	1 S.	
Malvaceæ	4	2	1 widely; 1 S. & W. I.	
Sterculiaceæ	2	2		
Tiliaceæ	1	0	1 S. & W. I.	
Malpighiaceæ	2	2		
Zygophyllaceæ	2	2		
Rutaceæ	5	4	1 N.W.	
Carried forward	30	17	13	2

Orders.	Total.	Endemic.	Extending to other parts of America.	Extending beyond America.
Brought forward	30	17	13	2
Simarubeæ	3	2	1 N.W.	
Celastrineæ	2	1	1 N.W.	
Rhamnaceæ	1	0	1 N.W.	
Sapindaceæ	1	0	1 N.W.	
Anacardiaceæ................	2	2		
Leguminosæ	6	2	2 N.W.; 1 widely; 1 W. I.	
Rosaceæ....................	3	2	1 N.W.	
Saxifragaceæ	3	0	1 N.W.; 1 N.E. & S.; 1 S.	
Combretaceæ	3	0	1 widely; 1 S. & W. I.; 1 S.	3
Lythrarieæ..................	1	0	1 S. & W. I.	1
Onagrarieæ	5	4	1 N.W.	
Loasaceæ	3	1	1 N.W.; 1 N.W. & S.	
Cucurbitaceæ................	6	4	2 S. & W. I.	
Umbelliferæ	3	1	1 N.E. & S.; 1 S.	1
Caprifoliaceæ	1	1		
Rubiaceæ	7	7		
Compositæ	36	26	5 N.W.; 2 S.; 3 S. & W. I.	1
Campanulaceæ	1	0	1 S. & W. I.	1
Monotropeæ	2	0	1 N.W. & N.E.; 1 widely.	1
Lennoaceæ	1	1		
Primulaceæ	1	0	1 N.W. & N.E.	1
Myrsineæ	1	1		
Sapotaceæ	1	0	1 S. & W. I.	
Apocynaceæ	2	1	1 N.W. & W. I.	
Asclepiadeæ	2	2		
Loganiaceæ	2	1	1 N.E. & W. I.	
Polemoniaceæ	1	1		
Boragineæ	2	0	1 S.; 1 Guadalupe I.	1
Convolvulaceæ	1	0	1 widely.	1
Solanaceæ	3	2	1 S.	1
Scrophularineæ	6	6		
Gesneraceæ	1	0	1 S.	
Bignoniaceæ	4	1	1 N.W.; 1 S.; 1 S. & W. I.	
Acanthaceæ	12	9	1 N.W.; 1 S.; 1 S. & W. I.	1
Labiatæ	3	1	2 N.W.	
Nyctagineæ	4	2	1 N.W.; 1 N.W. & N.E.	
Amarantaceæ................	2	0	2 N.W.	
Chenopodiaceæ	1	0	1 S. & W. I.	
Phytolaccaceæ	5	1	1 N.W.; 1 N.W. & W. I.; 1 widely; 1 S. & W. I.	1
Polygonaceæ	1	1		
Balanophoreæ	1	0	1 S.	
Euphorbiaceæ	5	1	1 N.W.; 2 S.; 1 N.E., S., & W. I.	
Ceratophyllaceæ..............	1	0	1 widely.	1
Coniferæ....................	1	0	1 N.W.	
Burmanniaceæ	1	0	1 widely.	
Orchideæ	13	10	1 N.W.; 2 S. & W. I.	
Amaryllideæ	2	1	1 S.	
Liliaceæ	4	3	1 N.W.	
Commelinaceæ	6	3	1 S.; 2 W. I.	
Palmæ	3	3		
Aroideæ	1	0	1 widely.	1
Cyperaceæ	1	0	1 S. & W. I.	1
Gramineæ	12	5	1 N.W.; 1 N.W. & N.E.; 5 widely.	2
Filices	2	1	1 S.	
Totals	**228**	**127**	**101**	**21**

Judging from the scanty data available for comparison, the proportion of monotypic genera in Mexico and Central America is exceptionally high, amounting to 228, or 12·3 per cent., of all the genera of vascular plants. One hundred and twenty-seven of these monotypes are endemic; 101 extend to other parts of America, and twenty-one have a wider range. In Australia about 10·8 per cent. of the genera are monotypic. Our monotypic genera are distributed among seventy natural orders, and they are specially numerous in the Compositæ, Orchideæ, and Gramineæ, though they are proportionately more numerous in some of the smaller natural orders. One point this Table specially brings into prominence is the extension of the North-Mexican flora into western North America. Thus, of the 101 monotypic genera which extend to other parts of America, thirty have a north-western extension only, and twelve of those having a wider range also occur in western North America. Of course, those of the latter category possess no particular significance; but those of the former category constitute an important addition to the evidence bearing upon the natural boundaries of the flora of North Mexico and the contiguous countries. In addition to these thirty monotypes, there are fifty-five genera, belonging to twenty-two natural orders, which are common to Mexico and the North-west only; and twenty-one of them are Compositæ.

It may be of interest to insert here a list of the natural orders with the number of genera represented in Mexico and Central America by only one species. Including the monotypes already dealt with, they number no fewer than 660 genera, or 35·7 per cent. of the total, belonging to 120 orders. In the Compositæ the disproportionately large number of eighty-two genera belong to this category, and in America north of Mexico there are within nine of the same number of indigenous genera of Compositæ represented by only one species. Mueller* states that there are 550 genera in Australia, represented by only one species each.

Number of Genera represented by only one Species.

Ranunculaceæ	1
Dilleniaceæ	1
Anonaceæ	2
Menispermaceæ	3
Nymphæaceæ	2
Papaveraceæ	2
Fumariaceæ	1
Cruciferæ	8
Capparideæ	4
Resedaceæ	1
Violarieæ	1
Carried forward	26
Brought forward	26
Bixineæ	4
Vochysiaceæ	1
Frankeniaceæ	1
Caryophylleæ	2
Portulaceæ	4
Elatineæ	1
Guttiferæ	3
Ternstrœmiaceæ	4
Malvaceæ	9
Sterculiaceæ	4
Carried forward	59
Brought forward	59
Tiliaceæ	3
Malpighiaceæ	6
Zygophyllaceæ	2
Geraniaceæ	2
Rutaceæ	9
Simarubaceæ	5
Ochnaceæ	1
Burseraceæ	1
Meliaceæ	1
Chailletiaceæ	1
Carried forward	90

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* 'Lecture on the Flora of Australia,' 1883, p. 11.

Brought forward	90
Celastrineæ	3
Rhamnaceæ	2
Sapindaceæ	4
Anacardiaceæ	7
Coriarieæ	1
Leguminosæ	28
Rosaceæ	7
Saxifragaceæ	5
Crassulaceæ	1
Halorageæ	2
Rhizophoreæ	2
Combretaceæ	5
Myrtaceæ	5
Melastomaceæ	9
Lythraceæ	4
Onagrarieæ	7
Loasaceæ	4
Turneraceæ	1
Passifloraceæ	1
Cucurbitaceæ	9
Datiscaceæ	1
Ficoideæ	2
Umbelliferæ	10
Araliaceæ	2
Caprifoliaceæ	1
Rubiaceæ	26
Compositæ	82
Goodenovieæ	1
Campanulaceæ	5
Monotropeæ	3
Carried forward	330
Brought forward	330
Lennoaceæ	1
Primulaceæ	3
Myrsineæ	3
Sapotaceæ	3
Apocynaceæ	10
Asclepiadeæ	9
Loganiaceæ	4
Gentianeæ	3
Polemoniaceæ	1
Hydrophyllaceæ	1
Boragineæ	4
Convolvulaceæ	1
Solanaceæ	8
Scrophularineæ	18
Orobanchaceæ	1
Gesneraceæ	6
Bignoniaceæ	5
Acanthaceæ	16
Verbenaceæ	5
Labiatæ	12
Nyctagineæ	5
Illecebraceæ	3
Amarantaceæ	10
Chenopodiaceæ	4
Phytolaccaceæ	7
Polygonaceæ	2
Podostemaceæ	2
Piperaceæ	1
Laurineæ	5
Loranthaceæ	2
Carried forward	485
Brought forward	485
Santalaceæ	1
Balanophoreæ	3
Euphorbiaceæ	9
Urticaceæ	8
Juglandeæ	1
Cupuliferæ	2
Lacistemaceæ	1
Ceratophylleæ	1
Coniferæ	3
Hydrocharideæ	1
Burmanniaceæ	1
Orchideæ	31
Scitamineæ	2
Bromeliaceæ	4
Hæmodoraceæ	1
Irideæ	5
Amaryllideæ	6
Liliaceæ	6
Pontederiaceæ	1
Commelinaceæ	6
Palmæ	10
Typhaceæ	1
Aroideæ	5
Alismaceæ	2
Naiadaceæ	1
Cyperaceæ	8
Gramineæ	44
Filices	9
Rhizocarpeæ	2
Total	660

DISTRIBUTION OF THE SPECIES.

The two Tables, one showing the number of species of each of the secondary groups of the phanerogams and of the vascular cryptogams in the subdivisions of Mexico and Central America, and the other the extensions to other parts of America and to other countries, are constructed upon exactly the same plan as those on pages 208 and 209, showing the distribution of the genera, and the same remarks apply to them; therefore no further explanation is required.

Total number of Species in Mexico and Central America, and number in each Division.

	Total in Mexico and Central America.	Total Endemic.	North Mexico.	South Mexico.	Mexico, uncertain.	Guatemala.	Honduras and Salvador.	Endemic in Mexico, Guatemala, and Honduras.	Nicaragua.	Costa Rica.	Panama.	Endemic in Nicaragua, Costa Rica, and Panama.
POLYPETALÆ .... (72 Nat. Orders.)	3809	2577	1017	1893	530	411	37	2191	272	238	610	263
GAMOPETALÆ .... (36 Nat. Orders.)	4019	2938	1253	2113	519	400	63	2459	280	382	379	312
INCOMPLETÆ .... (28 Nat. Orders.)	1237	819	305	624	177	124	21	641	87	139	169	124
MONOCOTYLEDONES ...... (23 Nat. Orders.)	2501	1815	327	1193	458	393	30	1362	202	326	275	376
GYMNOSPERMÆ .... (3 Nat. Orders.)	60	44	28	25	14	9	1	40	2	1	3	1
Totals of Phanerogamæ . **(162** Nat. Orders.)	**11626**	**8193**	**2930**	**5848**	**1698**	**1337**	**152**	**6693**	**843**	**1086**	**1436**	**1076**
CRYPTOGAMÆ VASCULARES . (5 Nat. Orders.)	607	182	110	397	22	272	8	136	141	54	120	32
Grand Totals.. .... **(167** Nat. Orders.)	**12233**	**8375**	**3040**	**6245**	**1720**	**1609**	**160**	**6829**	**984**	**1140**	**1556**	**1108**

Number of Mexican and Central-American Species extending to other Regions.

	Total.	Restricted to America.	Extending to other parts of America.				Extending to the Old World and Pacific Islands.										
			North-west America.	North-east America.	South America.	West Indies.	Widely.	Europe.	Mediter-ranean region.	Asia.	East Asia.	Africa and Masca-rene I.	Austral-asia.	Antarctic region.	Polynesia.	Sand-wich Islands.	Gala pagos Islands.
Polypetalæ .... (72 Nat. Orders.)	1232	1096	386	166	725	409	89	3	....	5	2	22	5	....	1	4	7
Gamopetalæ .... (36 Nat. Orders.)	1081	1008	470	156	509	341	55	1	1	5	....	6	1	1	1	....	4
Incompletæ .... (28 Nat. Orders.)	418	385	134	67	222	164	22	....	....	1	....	8	....	....	....	1	2
Monocotyledones ...... (23 Nat. Orders.)	686	580	126	163	498	302	88	5	....	4	....	8	....	....	....	1	....
Gymnospermæ .... (3 Nat. Orders.)	16	16	9	1	3	3	....	....	....	....	....	....	....	....	....	....	....
Totals of Phanerogamæ . (162 Nat. Orders.)	**3433**	**3085**	**1125**	**553**	**1957**	**1219**	**254**	**9**	**1**	**15**	**2**	**44**	**6**	**1**	**2**	**6**	**13**
Cryptogamæ Vasculares . (5 Nat. Orders.)	425	319	52	50	369	278	83	....	....	3	....	11	....	....	5	....	4
Grand Totals .... (167 Nat. Orders.)	**3858**	**3404**	**1177**	**603**	**2326**	**1497**	**337**	**9**	**1**	**18**	**2**	**55**	**6**	**1**	**7**	**6**	**17**

Respecting the distribution of the species within Mexico and Central America there is little to be said beyond repeating the statement, made under the genera, that Mexico is the only part which has been sufficiently explored to enable us to form something approaching a correct estimate of the extent of its flora. But the figures speak for themselves: 65 per cent. of the species, belonging to about 78 per cent. of the genera, inhabit South Mexico, that is, including the "uncertain," which we now find properly belongs to it. The botany of the Isthmus part of the Province or State of Panama is also tolerably well known, though doubtless by no means exhausted; and the poverty of the flora of this region may be accounted for by the very trifling elevation of the highest part. Notwithstanding the fragmentary nature of our knowledge of the vegetation of some portions of Central America, what we do know being partly the results of the labours of competent botanists like Œrsted and Seemann, and partly of enthusiastic collectors such as Sutton Hayes, may be regarded as a fair sample of the whole; and future collections are not likely to invalidate, or even greatly modify, the deductions to be drawn from the material from which our Tables were constructed. It may be assumed, too, that a moiety at least of future discoveries in the less explored districts will consist of species already recorded from the neighbouring countries; hence the total numbers of genera and species for the whole area will not be so largely augmented as might at first be supposed. Still, considering that our total number of species from Honduras and Salvador is only 160, from Nicaragua less than 1000, and from Costa Rica about 1150, and that the vegetation of these countries is reported generally as rich, it is, perhaps, a little hazardous to advance the theory that comparatively few generic types remain undiscovered. But the flora of Central America, so far as it is known, is so largely South-American that we confidently expect that the additions will be mainly specific.

This view is strengthened by a closer examination of the facts connected with the extension of South-American genera and species into Central America and northward into the tropical parts of Mexico. But before proceeding to the discussion of this part of the subject, it may be as well to tabulate the percentages of species in each of our primary divisions and subdivisions of Mexico and Central America and the extensions beyond, as percentages give a much better idea of the relative proportions than mere numbers.

Numbers and Percentages of Endemic Species of Phanerogamic Plants in Mexico and Central America.

	Number.	Per cent.	
Total endemic	8193	70·5	of 11626
Endemic in North Mexico to Honduras	6693	81·7	of 8193
„ Nicaragua to Panama	1076	13·1	„
„ the combined areas	424	5·2	„
	8193	100·0	

Numbers and Percentages of Species of Phanerogamic Plants extending beyond Mexico and Central America.

	Number.	Per cent.
Extending to other parts of America	3433	29·5 of 11626
Restricted to America	3085	89·9 of 3433
Extending to the Old World and Pacific Islands	348	10·1 ,,
	3433	100·0

Contrary to what obtains for genera, there is a high percentage of endemic species in Mexico and Central America, though not quite so high perhaps as in Australia and in extratropical South Africa. In West Australia the specific endemic element is 85 per cent. of the whole phanerogamic flora, and in Bolus's "South-western region" of the South-African flora it is perhaps nearly as high; while Grisebach's investigations of the West-Indian flora give only about 50 per cent. Without making a separate and very laborious calculation, we cannot say precisely what the proportions are in South Mexico, but from a rough approximation we have no hesitation in fixing the endemic element at over 80 per cent. of the whole, especially as 81·7 per cent. of the endemic species are restricted to Mexico, Guatemala, and Honduras, as opposed to 13·1 per cent. in Nicaragua, Costa Rica, and Panama.

We now pass to the percentages of species in the various regions and areas designated in the previous Tables.

Numbers and Percentages of Species of Phanerogamic Plants in each division: total 11626 *.

	Number.	Per cent.
North Mexico	2930	25·2 of 11626
South Mexico and Uncertain	7546	64·9 ,,
Guatemala	1337	11·5 ,,
Honduras	152	1·3 ,,
Nicaragua	843	7·3 ,,
Costa Rica	1086	9·3 ,,
Panama	1436	12·4 ,,

Numbers and Percentages of Species of Phanerogamic Plants extending to other parts of America: total 3433.

	Number.	Per cent.
North-west America	1125	32·7 of 3433
North-east America	553	16·1 ,,
South America	1957	57·0 ,,
West Indies	1219	35·5 ,,
Restricted to America	3085	89·8 ,,

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* It may be explained that the figures in these Tables do not check themselves by making totals of 100, because of the occurrence of the same species in more than one area; yet those relating to extensions beyond America come very near doing so, inasmuch as nearly all the species not belonging to the category of widely diffused are limited to one country in the Old World.

Numbers and Percentages of Species of Phanerogamic Plants extending to countries beyond America.

	Number.	Per cent.	
Extra-America	348	10·1	of 3433 [*]
Widely	254	73·0	of 348
Europe	9	2·6	,,
Mediterranean region	1	0·3	,,
Asia	15	4·3	,,
Eastern Asia only	2	0·6	,,
Africa and Mascarene Islands	44	12·6	,,
Australasia	6	1·7	,,
Antarctic region	1	0·3	,,
Polynesia	2	0·6	,,
Sandwich Islands	6	1·7	,,
Galapagos Islands	13	3·7	,,

Concerning this Table, a few words of explanation may facilitate its ready comprehension. It is limited to the phanerogamic element, as the cryptogamic element is not dependent on the same means and agencies of distribution. Out of a total of 11,626 species, 8193 (or 70·5 per cent.) are not known to occur outside of Mexico and Central America. The first section of the Table shows the proportionate distribution of all the species found within the different divisions of Mexico and Central America. The second section shows the numbers and percentages of the species to other parts of America, the total number being 3433, or 29·5 per cent. of our whole flora. The third section shows the distribution of the species extending beyond America, the total of which is 348, and all of which, as is demonstrated by the percentages given, occur in some other part of America as well as within our limits. This is rather remarkable, inasmuch as two of our genera, *Abelia* and *Erblichia*, are not found in any other part of America; but it should be mentioned that there are some divergences of opinion respecting the latter genus which would materially affect the question of its geographical area.

It will be perceived that 73 per cent. of the species ranging beyond America are plants of wide distribution, and as such, by whatever means they became so, throw no light on the problems of phyto-geography. The other elements of the extra-American extensions are discussed in special paragraphs.

[*] The total number of species found within our limits which also extend beyond.

RELATIONSHIPS OF THE FLORA WITH THE FLORAS OF OTHER REGIONS.

HAVING reviewed the various elements of the vegetation of Mexico and Central America and set forth its general distribution, we are now in a position to deal with the particulars of its relationships to, and connections with, the vegetation of other regions. Without attempting exact definitions of boundaries here, we may repeat that there are three distinct floral provinces within our limits, corresponding very nearly to the political boundaries which we were compelled to adopt on account of the plants of many collections not being localized more precisely. Thus Nicaragua, Costa Rica, and Panama, which may be collectively designated the southern area, constitute a province of the American and West-Indian tropical flora; and the northern area, comprising Salvador, Honduras, Guatemala, and Mexico, constitutes the Mexican flora. This naturally falls into two provinces, a northern and a southern, the latter including South Mexico and the country southward to the borders of Nicaragua, and the former North Mexico, Western Texas, New Mexico, and Arizona, except the alpine flora, with indefinable extensions into other territories. The abrupt cessation of orchids and other epiphytes, as well as some other classes of plants, coincides so nearly with our rough-and-ready boundary, adopted in ignorance of these circumstances, that there can be no question as to the propriety of separating North and South Mexico in a phyto-geographical disquisition.

We will first consider the American connections of the vegetation of Mexico and Central America.

Extensions into eastern and western North America.

For the purposes of this work eastern North America is the country east of the Mississippi; and Western, the country west of that river. This division was adopted because it was not found practicable to separate the central region from the western. As a matter of fact, the "western" extensions are mainly into the central region. The result of an analytical comparison of the north-eastern and north-western extensions fully bears out the theory of a North Mexican province, as roughly indicated in the preceding paragraph. Thus:—

	WESTERN EXTENSIONS.		EASTERN EXTENSIONS.	
	Genera.	Species.	Genera.	Species.
Dicotyledones	537	990	449	389
Monocotyledones	94	126	108	163
Totals	631	1116	557	552

Taking the numbers alone the contrast is not so very striking; but on examining the composition of the eastern extensions, we find that the number of genera exceeds the number of species, and that very many of the genera and species have a wider range, while the western extensions are mostly common to Mexico only. Moreover, about 40 genera and 70 species, almost exclusively West-Indian types, which only inhabit Southern Florida in North America, should be deducted, bringing the totals down to 517 genera and 482 species. Greater discrimination in tabulating would doubtless lead to further reductions. A noteworthy fact is the much larger proportion of monocotyledons in the eastern extensions, the numbers of both genera and species actually exceeding the western. Allusion has already been made to the large number of monotypic and other genera common only to Mexico and the North-west (see page 216).

In order to ascertain with some greater degree of precision the relationships between the flora of North Mexico and the adjoining countries to the north, we have tabulated Rothrock's fragment of the Botany of Arizona &c.

Statistics of the Flora of Arizona and the contiguous Territories, and its connections with the North Mexican.

Orders.	Genera.		Species.	
	Total.	Common to Mexico.	Total.	Common to Mexico.
Ranunculaceæ	12	7	36	6
Berberideæ	1	1	4	2
Papaveraceæ	3	2	3	1
Fumariaceæ	1	1	1	0
Cruciferæ	18	11	43	9
Capparideæ	4	3	10	3
Cistineæ	1	1	1	0
Violarieæ	1	1	4	0
Bixineæ	1	1	1	0
Polygalaceæ	3	3	4	3
Frankeniaceæ	1	1	1	1
Caryophyllaceæ	8	6	25	3
Portulaceæ	5	4	9	2
Elatineæ	1	1	1	1
Tamariscineæ	1	1	1	1
Hypericineæ	1	1	1	1
Malvaceæ	7	6	15	9
Sterculiaceæ	2	1	2	1
Linaceæ	1	1	3	3
Malpighiaceæ	1	1	1	1
Zygophyllaceæ	2	2	3	3
Geraniaceæ	3	3	5	0
Rutaceæ	2	1	2	1
Celastrineæ	1	0	6	0
Rhamnaceæ	4	4	7	3
Ampelideæ	2	1	3	2
Carried forward	87	65	192	56

Orders.	Genera.		Species.	
	Total.	Common to Mexico.	Total.	Common to Mexico.
Brought forward	87	65	192	56
Sapindaceæ	4	4	6	3
Anacardiaceæ	1	1	5	2
Leguminosæ	36	28	126	39
Rosaceæ	22	11	44	7
Saxifragaceæ	7	2	22	3
Crassulaceæ	3	3	6	2
Halorageæ	2	1	3	1
Lythraceæ	2	2	2	2
Onagrarieæ	7	4	37	11
Loasaceæ	3	3	8	3
Cucurbitaceæ	3	3	3	2
Cactaceæ	4	4	16	4
Datiscaceæ	1	..	1	..
Ficoideæ	2	1	2	1
Umbelliferæ	15	7	19	1
Cornaceæ	2	..	2	..
Caprifoliaceæ	5	3	8	2
Rubiaceæ	3	3	6	4
Valerianaceæ	2	1	3	..
Compositæ	93	68	255	80
Campanulaceæ	4	3	7	3
Vacciniaceæ	1	1	1	..
Ericaceæ	6	3	12	1
Monotropeæ	1	1	1	1
Primulaceæ	6	3	9	1
Oleaceæ	3	3	7	4
Apocynaceæ	2	2	3	2
Asclepiadeæ	3	3	10	6
Gentianaceæ	6	3	15	5
Polemoniaceæ	4	4	27	6
Hydrophyllaceæ	6	2	12	3
Boragineæ	8	7	21	7
Convolvulaceæ	6	5	15	11
Solanaceæ	6	6	17	8
Scrophularineæ	18	13	73	22
Orobanchaceæ	1	1	2	2
Bignoniaceæ	2	1	3	1
Acanthaceæ	6	6	6	5
Verbenaceæ	2	2	5	2
Labiatæ	21	15	34	12
Plantagineæ	1	1	2	1
Nyctagineæ	5	5	16	9
Phytolaccaceæ	1	1	1	
Polygonaceæ	6	4	49	10
Amarantaceæ	6	5	11	5
Chenopodiaceæ	11	6	23	9
Paronychieæ	1	..	1	..
Carried forward	447	320	1149	359

Orders.	Genera.		Species.	
	Total.	Common to Mexico.	Total.	Common to Mexico.
Brought forward	447	320	1149	359
Elæagnaceæ	2	..	2	..
Urticaceæ	2	2	5	1
Betulaceæ	2	1	4	..
Platanaceæ	1	1	1	1
Salicineæ	2	2	13	1
Euphorbiaceæ	5	4	16	6
Saurureæ	1	..	1	..
Juglandeæ	1	1	1	0
Cupuliferæ	2	1	10	2
Loranthaceæ	2	2	8	2
Santalaceæ	1	1	2	1
Coniferæ	6	4	18	8
Gnetaceæ	1	1	2	1
Orchideæ	6	6	8	2
Irideæ	2	2	4	0
Amaryllideæ	1	1	3	1
Alismaceæ	1	1	2	1
Naiadeæ	2	2	5	0
Typhaceæ	1	0	2	0
Liliaceæ	13	7	23	7
Xerotideæ	1	..	2	..
Juncaceæ	1	1	12	6
Commelinaceæ	1	1	1	0
Cyperaceæ	9	8	59	4
Gramineæ	47	33	120	26
Totals	560	402	1473	429

After these statistics had been obtained, it was discovered that it would have been better to include the whole of Mexico, because a considerable additional number of the Arizona and New-Mexican plants are known to exist in the more fully explored South Mexico, though they have not been found in the intervening country, where, however, they may be expected to occur.

Deducting the species of Ranunculaceæ, Coniferæ, Caryophyllaceæ, Rosaceæ, Saxifragaceæ, and other orders consisting largely of mountain-plants, the specific affinities even are very pronounced; but it is chiefly apparent in the genera. The small proportion of grasses common to the two areas is remarkable.

That the Mexican flora covers some part of California and extensively overlaps or intermingles with the peculiarly Pacific flora is certain, but where the boundary should be drawn is not so evident; indeed, in the absence of more complete data, it is impossible to fix it. At the same time it is also evident that we do encounter a very different vegetation in California; the characteristic Mexican types are rare, and soon disappear altogether, and their place is taken by a number of other genera. It should be understood that we allude specially to Southern California. We have not thought it worth while summarizing the botany of California for the purposes of this work, because to do it properly would involve a great expenditure of time; but we have roughly counted the Californian genera not represented in Mexico, and they amount approximately to 350, whereof 77 are peculiar. They consist largely of herbaceous plants, with additional genera of the Coniferæ and Cupuliferæ; the latter in the north. This number also includes a considerable proportion of northern genera which reach their southern limit in this State. The flora of Lower California is an extension from the north, and much less like that of the opposite coast of Mexico.

Extensions into South America and the West Indies.

The expression "extensions into South America and the West Indies" is used in this connection for convenience and to avoid ambiguity, though, strictly speaking, the extensions are, as a rule, perhaps, rather in the opposite direction. Originally no attempt was made to analyze the extensions into South America and the West Indies, the number of species common to each and our flora being thought sufficient for the purpose; but the result was nothing definite, wherefore the accompanying Table was drawn up. Possibly the amount of information it conveys is hardly commensurate with the labour bestowed upon it, because so much remains to be done in elaborating the details of the distribution of species in the West Indies and the northern and eastern parts of South America. Names rather than numbers would be more satisfactory in this case, and the particulars given in the paragraphs specially devoted to the distribution of the principal natural orders will be found more interesting. Reference to the Andine types which reach Mexico is made in the chapter on the mountain vegetation.

Proportional Distribution of Mexican and Central-American Species in South America and the West Indies.

	Common to both the West Indies and South America.	West Indies only.	Western South America only.	Eastern South America only.	Western and Eastern South America only.	Numbers of South-American types reaching Mexico or Guatemala, but not the West Indies.
Polypetalæ..........	190	55	143	66	212	265
Gamopetalæ	182	112	129	65	80	177
Incompletæ	97	43	36	30	34	72
Monocotyledones	179	71	64	99	103	183
Gymnospermæ	..	3	2	1	..	1
Totals	648	284	374	261	429	698

It should be mentioned that the division of South America into eastern and western regions is a very rough one, the main object in view being the separation of the western and Andine elements from the eastern. Thus Venezuela is reckoned eastern and New Granada western; but this very arbitrary and artificial boundary does not vitiate the results to the extent that might be supposed, because it is in a measure counteracted by the column enumerating the species common, nominally, to both the east and the west, the essentially eastern species being thereby largely eliminated from the Andine and truly western forms. As might be expected, the "western only" are considerably in excess of the "eastern only." The most striking feature in this Table is the large number of species common to South America, but not known to inhabit the West Indies.

Extensions into Countries beyond America.

Of the 1849 genera of vascular plants represented in Mexico and Central America, 787 recur in some part or parts of the Old World or in the Pacific Islands, and of these no fewer than 609 range widely, many of them very widely, leaving only 178 which are restricted to one country or region outside of America. Of the 12,233 species, 454 extend beyond America; 337 of them are widely diffused, and the rest, 117 in number, are of comparatively limited range. The general distribution of those of the last category may be seen by a glance at the Tables, pp. 218, 219, and the special distribution of some of them is of such great interest that it merits setting forth in some detail. Altogether sixty genera and seventeen species are common to America and Asia only, and seventy-four genera and fifty-five species to America and Africa or the African region (Mascarene Islands) only.

In a series of papers on the Statistics of the Flora of the Northern United States, published by Dr. Asa Gray about thirty years ago, he specially considered the relationships existing between the vegetation of Eastern North America and Eastern Asia *, and the object of the Table on p. 229 is to show how far these connections extend to Mexico.

From this Table are excluded all genera which are widely diffused in Asia. It will be seen that seventeen of the genera do not occur in America north of Mexico; and of the remainder only five occur in western and not in eastern North America, and these chiefly in the south-western part—thus emphasizing Dr. Gray's conclusions, which several botanists have sought to upset.

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* 'American Journal of Science and Arts,' 2nd series, vol. xxii. 1856, p. 217.

Genera inhabiting Eastern Asia and America only.

Orders.	Mexican Genera.	Distribution in America, north of Mexico.		Distribution in Eastern Asia.
		East.	West.	
Magnoliaceæ	Magnolia	*	....	Himalayas, China, Japan.
	Talauma	....	....	Himalayas, Japan.
Papaveraceæ	Bocconia	....	....	China.
Portulaceæ	Claytonia	*	*	China.
Ternstrœmiaceæ	Ternstrœmia	....	....	India to China.
	Cleyera	....	....	India to China.
Olacineæ	Schœpfia	....	....	India.
Rhamnaceæ	Microrhamnus	....	*	China, Japan.
	Sageretia	....	....	India to China.
Sapindaceæ	Negundo	*	....	Japan.
	Turpinia	....	....	India to China.
Sabiaceæ	Meliosma	....	....	India to China.
Leguminosæ	Amphicarpæa	*	....	Himalayas, Japan.
Saxifragaceæ	Hydrangea	*	....	Himalayas, China, Japan.
	Deutzia	....	....	Himalayas, China, Japan.
Umbelliferæ	Osmorrhiza	*	*	Himalayas, China, Japan.
Araliaceæ	Aralia	*	*	India to Japan.
	Dendropanax	....	....	India to Japan.
Caprifoliaceæ	Abelia	....	....	Himalayas, China, Japan.
Rubiaceæ	Mitchella	*	....	Japan.
Compositæ	Boltonia	....	*	India to China.
Monotropeæ	Monotropa †	*	*	Himalayas, China, Japan.
	Hypopithys †	*	*	Himalayas, China, Japan.
Primulaceæ	Dodecatheon	*	*	Behring Straits, both sides.
Apocynaceæ	Amsonia	....	*	Japan.
	Trachelospermum	*	....	Himalayas, China, Japan.
Loganiaceæ	Gelsemium	*	....	China, Sumatra.
Gentianaceæ	Halenia	*	....	India to China.
Polemoniaceæ	Phlox †	*	*	Eastern Siberia.
Scrophularineæ	Pentstemon †	*	*	Kamtschatka, Japan.
	Castilleja †	*	*	Siberia.
Orobanchaceæ	Boshniakia	....	*	Himalayas, Siberia, Japan.
Gesneraceæ	Klugia	....	....	India.
Labiatæ	Lophanthus	*	*	Siberia, China.
Nyctagineæ	Oxybaphus	*	*	Himalayas.
Piperaceæ	Houttuynia	....	*	Himalayas, China, Japan.
Juglandeæ	Engelhardtia?	....	....	India to China.
Coniferæ	Taxodium	*	....	China.
Orchideæ	Bletia	....	....	China, Japan.
	Physurus	....	....	India, Malaya.
	Arethusa	*	....	Japan.
Liliaceæ	Nothoscordum	*	....	China.
	Stenanthium	*	*	Sachalin.
	Zygadenus	*	*	Siberia.
Aroideæ	Homalomena	....	....	India, Malaya.
	Spathiphyllum	....	....	Malaya.

† The same species in both countries.

Mexican and Central-American Genera and Species only inhabiting Africa and the Mascarene Islands outside of America.

Orders.	Genera and Species.	Distribution.
Hypericineæ	Vismia	West tropical Africa.
Guttiferæ	Symphonia	Africa and Madagascar.
	„ globulifera *	W. trop. Africa.
	Rheedia	Two or more species Madagascar.
Malvaceæ	Sphæralcea	South Africa.
	Malachra radiata	W. trop. Africa.
Sterculiaceæ	Hermannia	Africa and Arabia, chiefly S. Africa.
	Melochia melissæfolia	W. trop. Africa.
	Kosteletzkeya	Madagascar.
Malpighiaceæ	Heteropterys	Tropical Africa.
Rutaceæ	Thamnosma	One species S. Africa ; one Socotra.
Simarubeæ	Quassia	One species W. Africa.
Meliaceæ	Guarea	One species W. Africa.
	Trichilia	Tropical Africa; one Madagascar.
	Swietenia	One species W. Africa.
Sapindaceæ	Paullinia pinnata	Trop. Africa, Madagascar.
Leguminosæ	Æschynomene sensitiva	W. trop. Africa.
	Stylosanthes viscosa	„ „ „
	Zornia tetraphylla	W. and S. Africa.
	Desmodium adscendens	W. trop. Africa, Madagascar.
	„ incanum	„ „ „ Mauritius.
	Centrosema	W. trop. Africa.
	„ virginianum	„ „ „
	Ecastaphyllum	„ „ „
	„ brownei	„ „ „
	Drepanocarpus	„ „ „
	„ lunatus	„ „ „
	Lonchocarpus sericeus	„ „ „
	Andira	„ „ „
	„ excelsa	„ „ „
	Hoffmanseggia	Two species S. Africa.
	Parkinsonia	One species S. Africa.
	Copaifera	Tropical Africa.
	Pentaclethra	One species tropical Africa.
	Desmanthus	Madagascar.
	Mimosa asperata	Trop. and S. subtrop. Africa.
	Calliandra portoricensis	W. trop. Africa.
Rosaceæ	Chrysobalanus	„ „ „
	„ ellipticus	„ „ „
	„ icaco	„ „ „
Rhizophoreæ	Rhizophora mangle	„ „ „
Combretaceæ	Conocarpus	„ „ „
	„ erectus	„ „ „
	Laguncularia	„ „ „
	„ racemosa	„ „ „
	Cacoucia	„ „ „
	„ coccinea *	„ „ „
Lythraceæ	Nesæa	Trop. and S. Africa, Masc. I.
Turneraceæ	Piriqueta	S. Africa, Madagascar.
	Erblichia	Madagascar.

* The only American species.

Mexican and Central American Genera and Species inhabiting Africa &c.

Orders.	Genera and Species.	Distribution.
Cucurbitaceæ	Cayaponia	One species W. trop. Africa.
Umbelliferæ	Eryngium fœtidum	W. trop. Africa.
Rubiaceæ	Sabicea	Trop. Africa, Madagascar.
	Bertiera	,, ,, ,,
	Diodia	,, ,, ,,
	Mitracarpum	Trop. and S. Africa.
Compositæ	Sparganophorus	W. trop. Africa.
	,, Vaillantii	,, ,, ,,
	Achyrocline	Trop. Africa, Madagascar.
	Aspilia	,, ,, ,,
	Melanthera	,, ,, and Sandwich I.
	Coreopsis.	
	Jaumea	,, ,,
Oleaceæ	Menodora	One species S. Africa.
Apocynaceæ	Malouetia	,, ,, W. trop. Africa.
Asclepiadeæ	Asclepias	Trop. and S. Africa.
Gentianeæ	Voyria	One species Trop. Africa.
Convolvulaceæ	Jacquemontia	,, ,, ,, ,,
	Ipomœa asarifolia	Trop. Africa.
Scrophularineæ	Vandellia diffusa	Trop. Africa, Madagascar.
	Hydranthelium	W. trop. Africa.
	,, egense	,, ,, ,,
	Capraria biflora	,, ,, ,,
	Melasma	Two species S. Africa.
	Seymeria	Madagascar.
Acanthaceæ	Siphonoglossa	Two species S. Africa.
Labiatæ	Cedronella	One species Canaries.
	Hyptis pectinata	Trop. and S. Africa.
Amarantaceæ	Telanthera	W. trop. Africa.
	,, maritima	,, ,, ,,
	Philoxerus aggregatus	,, ,, ,,
	,, vermicularis	,, ,, ,,
Podostemaceæ	Tristicha	Trop. Africa, Madagascar.
	,, hypnoides	,, ,, ,,
Piperaceæ	Peperomia pellucida	,, ,, ,,
Laurineæ	Ocotea	S. Africa, Mascarene I.
Euphorbiaceæ	Euphorbia prostrata	Trop. Africa, Mascarene I.
	Jatropha gossypiifolia	W. trop. Africa.
	Croton lobatus	,, ,, ,,
	Caperonia	Trop. Africa, Madagascar.
	Omphalea	One species Madagascar.
Urticaceæ	Chlorophora	,, ,, W. trop. Africa.
Scitamineæ	Renealmia	,, ,, ,, ,, ,,
	Thalia	,, ,, ,, ,, ,,
	Calathea	Two ,, ,, ,, ,,
Irideæ	Marica	One ,, ,, ,, ,,
Amaryllideæ	Zephyranthes	,, ,, ,, ,, ,,
Pontederiaceæ	Eichornia	One Am. sp. in Trop. Afr. and Madag.
	Heteranthera	Trop. Africa.
Palmæ	Elæis	,, ,,
Alismaceæ	Echinodorus	One species W. trop. Africa.
Cyperaceæ	Kyllinga odorata	Trop. Africa.
	,, vaginata	,, ,,
	Dichromena	One species in Trop. Africa.

Mexican and Central-American Genera and Species inhabiting Africa &c.

Orders.	Genera and Species.	Distribution.
Cyperaceæ	Scirpus cubensis	Trop. Africa.
	Scleria hirtella	Trop. and S. Africa.
	Carex glomerata	S. Africa.
Gramineæ	Paspalum compressum	Trop. Africa, Mascarene I.
	„ paniculatum	„ „ „ „
	Olyra	One species trop. Africa.
	Anthephora	Trop. and S. Africa.
	Trachypogon	One species S. Africa.
	Ctenium	Africa, Madagascar.
	Chloris petræa	S. Africa.

The genera in this Table belong to two categories, namely such as are represented in both countries by the same species, and such as are represented in the two countries by different species. They may be further classified into those represented by a single species in the one country and by several in the other; some having their headquarters in America, others in Africa. Where no specific name is given different species inhabit the two countries; and where the number of species is limited to one, it is indicated. In many instances where the species are the same there are strong grounds for suspecting an American origin of no very remote period; this is especially the case with the Leguminosæ, the seeds of which mostly bear long immersion in salt water without injury, and may have been carried across by ocean-currents. Others have probably been conveyed in ballast, or otherwise introduced through human agency. Again, there are others whose existence in Africa or Madagascar must date from remote times, and perhaps be regarded as instances of affinities in the botany of the two regions parallel to those pointed out by Wallace and others as existing in the animal kingdom. Several striking additions might be made to the foregoing Table, if we included such as are common to the African region and the West Indies or South America.

The total number of genera enumerated is ninety-six, whereof fifty-six are represented by different species in the two regions, and thirty-nine by the same species. Such of the genera as are given a separate line, followed by a species of the same genus in the next line, are restricted to America and Africa, and, added to the fifty-six represented by different species, make a total of sixty-nine genera common to the two countries, but not known to inhabit any other part of the world. Such genera as are followed by a specific name in the same line have a wider range.

Mexican and Central-American Genera and Species, with one exception, only extending to the Galapagos outside of America.

Orders.	Genera and Species.	Distribution.
Burseraceæ	Bursera.	
	„ graveolens.	
Leguminosæ	Dalea	Two endemic species.
	Acacia tortuosa.	
Combretaceæ	Conocarpus erecta	Also W. trop. Africa.
Lythraceæ	Cuphea.	
	„ balsamona	Probably introduced; not in early collections.
Loasaceæ	Mentzelia.	
	„ aspera	=Acrolasia squalida, Hook. f.? Charles Island only.
Turneraceæ	Turnera ulmifolia	Also widely colonized in India.
Cucurbitaceæ	Elaterium cordatum	One endemic species.
Cactaceæ	Opuntia	One, or more, endemic species.
	Cereus	„ „ „ „
Ficoideæ	Mollugo verticillata.	
Compositæ	Elvira	Two endemic species.
Apocynaceæ	Vallesia glabra.	
Acanthaceæ	Tetramerium	Near *T. ovalifolium*, Œrst.
Labiatæ	Hyptis capitata.	
	Salvia occidentalis.	
	„ tiliæfolia.	
	„ micrantha.	
Nyctagineæ	Boerhaavia hirsuta.	
Amarantaceæ	Pleuropetalum	One endemic species.
Euphorbiaceæ	Phyllanthus carolinensis.	
Orchideæ	Epidendrum	One endemic species.
	Govenia	„ „ ? „

This short list is exceedingly interesting as showing a westward extension of the American flora. Some of the plants named may be of recent introduction through human agency; but the bulk of them may be regarded as indigenous in the sense of having reached the islands independently of man. Such a direct relationship to the American flora does not exist in any of the other Pacific Islands. Traces of it are found here and there. For instance, of the otherwise Andine genus *Osteomeles* there is one species in the Pacific Islands, ranging from Pitcairn Island and the Sandwich Islands to Maingaia and the Bonin Islands, or through nearly ninety degrees of longitude. In Pitcairn Island it is associated with such littoral plants as *Morinda citrifolia*, *Guettarda speciosa*, and *Cerbera odollam*, and the characteristic Australasian genus *Metrosideros*. The highly differentiated flora of the Sandwich group contains an element more remotely though not less certainly connected with the American, associated with an Australasian element largely preponderating in individuals, especially of a species of *Metrosideros*, a phyllodineous *Acacia*, and a *Cyathodes*.

We will conclude these comparisons with the floras of extra-American regions with an exposition of the extensions southward through the Andes and the Antarctic Islands to Australia and New Zealand. The examples are not numerous, but they are unmistakable, consisting almost entirely of plants undoubtedly indigenous in the various widely sundered areas.

Mexican Genera and Species of otherwise mainly Andine, Antarctic, and Australasian distribution.

Orders.	Genera and Species.	Distribution.
Magnoliaceæ	Drimys	Andes to Cape Horn, N. Zealand, Australia northward to Borneo.
Caryophyllaceæ	Colobanthus	Andes, Heard, Kerguelen, and S. Paul Islands, Australasia.
	„ quitensis	Andes to Cape Horn, N. Zealand.
Portulaceæ	Claytonia	Andes, Australia.
	Calandrinia	Southward to Chili and in Australia.
Malvaceæ	Malvastrum spicatum	Southward in America and in Australia.
Coriarieæ	Coriaria thymifolia	Temp. S. America, N. Zealand.
Rosaceæ	Acæna	Andes, Antarctic Islands, Australasia.
Onagrarieæ	Œnothera	America, and one species in Tasmania.
	Fuchsia	America, and 3 or 4 species N. Zealand.
Umbelliferæ	Oreomyrrhis	Andes, Australasia.
	„ andicola	Andes, Australia, N. Zealand.
	Crantzia	America, Australia, N. Zealand.
	„ lineata	„ „ „
	Daucus brachiata	„ „ „
Rubiaceæ	Nertera depressa	Andes, Tristan da Cunha, Australasia, Sandwich Islands.
Compositæ	Flaveria	Southward to Chili and in Australia.
	Erechthites	America, Australia, N. Zealand.
	Microseris	N.W. America, Chili, Australia, N. Zealand.
Ericaceæ	Pernettya	Chili, Tasmania, N. Zealand.
Sapotaceæ	Lucuma	S. America, Australia, N. Caledonia.
Convolvulaceæ	Breweria	America, Australia.
Solanaceæ	Nicotiana	America, Australia, Polynesia.
Scrophularineæ	Calceolaria	Andes to Patagonia and the Falklands, and in N. Zealand.
Polygonaceæ	Muehlenbeckia	Andes, Australasia, Polynesia.
Monimiaceæ	Mollinedia	S. America, Australia.
Proteaceæ	Roupala	S. America, N. Caledonia.
Irideæ	Orthrosanthus	Andes, Brazil, Australia.
Cyperaceæ	Uncinia	W. Indies, Andes, Antarctic Islands, Australasia, Sandwich Islands.
Gramineæ	Distichlis	Andes, Australia.

The foregoing list is given merely to show that there is a connection between the Antarctic and Andine floras, a connection that is more apparent when the comparison is made to include American plants not extending northward to Mexico *. The most

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* See Hemsley, 'Botany of the 'Challenger' Expedition: Introduction to the Reports on Insular Floras,' p. 52.

pregnant fact is that the genera are, almost without exception, much more strongly developed in America than they are in Australasia and the Antarctic islands. But if we take the vegetation generally of the southern coldest zone and regions the preponderance of what may be termed American types, in contradistinction to those which are more fully represented in the Australian region, is not so great; and if the bulk of Antarctic vegetation seems clearly traceable to America, the isolation in South America of such essentially Australasian types as *Lebetanthus* (Epacrideæ) and *Leptocarpus* (Restiaceæ) is not easily explained.

FURTHER DETAILS OF THE DISTRIBUTION OF SOME OF THE MORE PROMINENT NATURAL ORDERS.

Under each natural order and genus and species in the Enumeration some particulars are given of its general distribution, as well as any peculiarities of its distribution that could be expressed in a few words; and this information is amplified and augmented in the preceding Tables, while the succeeding paragraphs are devoted to a fuller exposition of the general and special features of the leading natural orders in the vegetation of Mexico and Central America. Something of interest might be written respecting the composition and distribution of each natural order, and much more concerning those treated of, but it would be more in place in a work dealing with the phytogeography of the world than here.

Ranunculaceæ.

All the seven genera of this order in Mexico and Central America are of wide range, and there is, perhaps, no other large order of dicotyledons in which so high a proportion of the genera has so wide a range. Of the forty-nine species, twenty-seven are endemic, eighteen others restricted to America, leaving only four that extend to other parts of the world. Two genera, *Aquilegia* and *Delphinium*, find their southern limit in America in Guatemala and Mexico respectively.

Cruciferæ.

We have of this ubiquitous, mainly herbaceous, order of temperate and cold regions twenty genera, two of them endemic, and five others restricted to America; and of the remainder eleven are widely diffused and two common to the Mediterranean region. Forty-two out of seventy-six species are endemic, and only four extend beyond America. *Sisymbrium* is the most numerous in species.

Cistineæ.

Helianthemum offers one of the most notable connections with the Mediterranean region. It is also represented by one or more species in extratropical South America. *Lechea* and *Hudsonia* are peculiar to North America, the former extending southward to Guatemala. All the American Cistineæ have comparatively inconspicuous flowers, in striking contrast to those of the Old World.

Vochysiaceæ.

A distinct wholly American order of trees and shrubs placed next to the Polygalaceæ by Bentham and Hooker. It comprises seven genera and about 125 species, nearly all of which inhabit either Tropical Brazil or Guiana, or both. A very few species of *Vochysia* are found in Colombia and Eastern Peru, and one Brazilian species (*V. ferruginea*, Mart.) extends northward of the Isthmus of Panama, occurring at Lion Hill and between Cruces and the town of Panama, as well as in the island of Coiba, off the western coast of Veraguas, about two degrees further north *. The genus *Trigonia* has, however, the widest area of any of the Vochysiaceæ, reaching the southern limits of the order in Brazil, and the western limits in Ecuador; and it is also represented as far north as Guatemala, as appears from Bernoulli's last collection. Humboldt, Bonpland, and Kunth (Nov. Gen. et Sp. v. p. 141) describe a species of *Trigonia*, which we have not seen, from the Andes of Quindiu at an elevation of 9000 feet. No member of the Vochysiaceæ has hitherto been recorded from the West Indies.

Caryophyllaceæ.

The rediscovery of Moçino and Sesse's genus *Cerdia*, previously known only from their drawings, by Parry and Palmer, is one of the most interesting results of their investigations in the State of San Luis Potosi; they also added two species to this reduced type of the order. *Hymenella* is a monotype, and *Colobanthus* is an Andine and Australasian genus. *Drymaria*, of which one American species has also a wide range in the Old World, and one is endemic in Australia, finds its greatest concentration in Mexico, where there are nearly a score of species.

Fouquierieæ.

The genus *Fouquieria*, comprising four or five species, constitutes in itself this tribe of the Tamariscineæ. It is restricted to Mexico and the contiguous countries, from Western Texas to South-eastern California and Lower California. The species are shrubs or small trees with conspicuous brilliantly coloured flowers, so anomalous in structure that the genus has been not only described thrice, but referred to various orders, including the Polemoniaceæ, which it is not unlike in its gamopetalous corolla, exserted stamens, and three styles. It has also been proposed as an independent natural order. Most botanists, however, agree that its greatest affinities are with the Tamariscineæ and neighbouring orders. Humboldt treated it as an anomalous genus near the Portulaceæ. Like the Andine *Columellia*, it is one of those isolated genera without any near allies that can be placed in no natural order without enlarging its diagnosis. In the dry regions the species of *Fouquieria* form very striking objects when in flower.

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* J. D. Smith has since described (Coulter's Botanical Gazette, 1887) a species of *Vochysia* from Guatemala.

Marcgraviaceæ.

This interesting group of shrubs and small trees is peculiar to America, and may, for our purpose, be regarded as an independent natural order; in fact its claims to this rank are perhaps greater than those of some others generally recognized as such. The highly curious and various "nectar-cups" of these plants deserve a more thorough investigation than they have yet been subjected to, inasmuch as their economy is still imperfectly understood *. Four genera and about forty species have been described; their greatest concentration being in Brazil, though they range from Mexico and the West Indies to Brazil, Peru, and Bolivia, as many as ten inhabiting Peru. Three out of four of the genera occur within our limits, and the same three are represented in the West Indies, one being generally spread from Cuba to Trinidad, while the other two are only in the latter island.

Ternstrœmiaceæ.

The only member of this order besides the tribe Marcgraviaceæ deserving special mention here is the singular monotypic *Pelliceria*, an inhabitant of the mangrove-swamps in southern Panama and Colombia, and in popular parlance it is a kind of mangrove. While possessing the structural characters of the order it exhibits the habit and vegetative development of the Rhizophoreæ or true mangroves.

Malvaceæ.

After making a very large reduction of doubtful and obscure species this order stands twelfth in numerical strength, and nearly half of the genera are represented in Mexico and Central America. The only endemic genera are the monotypic *Ingenhousia* and *Montezuma*; and half of the remainder extend to other countries, most of them being generally dispersed. Just about half of the 182 species are endemic, and fourteen are of wide distribution. Noteworthy Malvaceæ in our own region are the solitary species of the peculiarly Tropical American small arboreous genera *Ochroma*, *Chorisia*, *Hampea*, and *Cavanillesia*.

Sterculiaceæ.

This order includes a considerable number of curious forms belonging to the various tribes into which it has been subdivided, as for example *Quararibea*, the monotypic *Bernoullia* and *Cheirostemon*, the large African genus *Hermannia*, represented in the Texano-Mexican region by three or four species, and the singularly formed American *Ayenia*. Among these the celebrated *Cheirostemon* of the uplands of Mexico and Guatemala is the most interesting; it abounds in the forests at altitudes of 7000 to 9000 feet, and in some places ascends to 10,000 feet. Together with *Fremontia californica*, which inhabits dry hills from Pitt River to San Diego in California, it constitutes the tribe Fremontieæ *; and, apart from the oblique staminal tube and elongated anthers overtopped by the long connective, there is little to distinguish the two genera. Indeed Baillon has united them under the earlier generic name *Cheiranthodendrum*, a name given by Larreategui in a botanical description of the Mexican tree, of which there is a French translation by Lescallier, though we have seen neither the original nor the translation. It appears, however, that Larreategui sufficiently described and figured the plant under the name *Cheiranthodendrum pentadactylon*, and there seems to have been no justification for the change in the name made by Humboldt and Bonpland.

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* In the 'Gardeners' Chronicle,' n. s. xiv. (1880) pp. 11–13, we have brought together all the available information on this subject, with illustrations of all the principal modifications of the nectar-cups.

Rutaceæ.

Several interesting facts are disclosed in connection with the distribution of this order, which numbers in our region fourteen genera, six of them endemic in Mexico, and five others restricted to America; and twenty-six species, whereof nineteen are endemic and the rest peculiar to America. No fewer than five of the genera are monotypic; four of these being endemic and the fifth extending into New Mexico. There is one species of *Peganum* inhabiting North and New Mexico; and one species of *Thamnosma* is endemic in South Africa and one in Socotra, while the others are natives of North Mexico and the country to the north, from Texas westward to California. Excluding the Diosmeæ, which are peculiar to South Africa, and the Boronieæ, which are wholly Australasian, all the tribes of the Rutaceæ are represented.

Leguminosæ.

Taking the numbers given in Bentham and Hooker's 'Genera Plantarum,' the Leguminosæ comprise 5·3 per cent. of the genera and 6·8 per cent. of the species of all flowering-plants. Of course these figures can only be regarded as rough approximations, yet they doubtless represent very nearly the correct proportions. The Leguminosæ are almost universally dispersed, the suborder Papilionaceæ reaching the alpine and arctic limits of phanerogamic vegetation; the Cæsalpinieæ and Mimosæ being nearly confined to tropical and subtropical regions. In New Zealand, however, the order is exceedingly sparsely represented, and it is altogether absent from the antarctic islands. Furthermore, in remote oceanic islands Leguminosæ are absolutely unrepresented by native species, especially in those islands whose shores are unfavourable to colonization by drift seeds, or they are represented almost exclusively by species found elsewhere, and chiefly by those having a wide range, which is evidently very largely due to oceanic currents. This is noteworthy, as being the converse of what obtains for the Compositæ under similar conditions. The Leguminosæ of Mexico and Central America comprise 27 per cent. of the genera and 14·5 per cent. of the species of Leguminosæ in the whole world, and they constitute 8·1 per cent. of the species of flowering-plants within our limits. This last figure seems rather low, and the actual number of species (944) affords a more striking illustration of their prevalence. Out of a total of seventy-eight genera of the Papilionaceæ, only five are endemic, four of these being restricted to the Mexican region; thirty-two others do not extend beyond America, while forty-one, more than half, have a wider range, and no fewer than thirty-four are widely dispersed. Passing to the Cæsalpinieæ and the Mimoseæ, it will be found that there is no endemic genus; that eleven of the genera are restricted to America, and that of the remaining twenty-one, sixteen are widely spread. Such proportions are unapproached by any other exogenous order of numerous genera, and only exceeded among the large endogenous orders by the grasses, sedges, and rushes. The fact that eighty-four out of the 110 genera of Leguminosæ occur in South Mexico and sixty-five of them in Panama gives some idea of the richness of these floras, especially when it is considered that even these are still far from having been fully investigated.

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* Dr. Asa Gray has recently raised this tribe to the rank of a natural order.

Proceeding to the species of the Leguminosæ some equally interesting facts appear. 61 per cent. are endemic, chiefly in the Mexican region; other 34 per cent. are restricted to America, and 5 per cent. extend beyond America; and of the forty-seven species extending beyond America thirty-one are of wide range. Concerning some of the latter it may be said that their present distribution may in part be due to human agency, though all such as are probably of this category were eliminated before the calculations were made. Twelve of the species of extra-American range are elsewhere only found in western Africa; and from what is known of the distribution of most of the genera, the probabilities are that they are migrations from America; but this question is discussed in another place.

A few additional facts respecting the distribution of genera deserve recapitulation here. Thus, *Lupinus*, with the exception of a few annual species in the Mediterranean region, is exclusively American, and numbers from eighty to one hundred species, ranging from Canada and British Columbia to Uruguay and Chili, a vast majority of the species being peculiar to the western side of the country; no fewer than forty-four coming within the limits of the "Botany of California." Only four or five species inhabit the Atlantic States, and of these two are remarkable among North-American species in having unifoliolate leaves. The genus is unknown in the West Indies and north-eastern South America, but there are several simple-leaved species in Brazil. In Mexico and Guatemala some of the species reach the altitudinal limits of phanerogamic vegetation. *Hosackia*, *Eysenhardtia*, *Petalostemon*, and *Dalea* are characteristic American genera of temperate regions; the last-named being essentially Mexican, and numbering nearly a hundred species within our limits. It extends both north and south, however, and two species are endemic in the Galapagos. The Cuban *Dalea tephrosioides*, Griseb., is a genuine *Indigofera*, according to a manuscript note (extracted from C. Wright's letters) in the Kew copy of Grisebach's 'Catalogus Plantarum Cubensium.' *Desmodium*, a genus of very wide range, and numbering upwards of 150 species, is represented by about eighty in Mexico and Central America. There are also many species in the Atlantic States, and several inhabit the country as far westward as New Mexico and Arizona, but not one has been found in California. Among Cæsalpineæ, *Hoffmannseggia* is remarkable in having two endemic species in South Africa; otherwise the genus is American, and essentially western. Four or five genera are monotypic, but two at least of them are obscure plants. The Mimoseæ are essentially tropical, and largely American, both generically and specifically; the numbers in the Old World, especially in Australia and Africa, being small after deducting the species of *Acacia*. Bentham * divides them into twenty-nine genera, nineteen of which are represented in America, and eight of them are peculiar to America; and he describes 1263 species, of which 763 are American, leaving 500 species, including 293 Australian and fifty-seven African species of *Acacia*, for the rest of the world. In Mexico and Central America there are fifteen genera, none peculiar; and 199 species, whereof 110 are endemic, and nine only extend beyond America.

Rosaceæ.

All the tribes of this order, with the exception of the African Neuradeæ, are represented; and about one third of the genera and one tenth of the species are from within our limits, that is, if we disregard the multitude of proposed critical species of *Rosa* and *Rubus*. Of the tribe Quillajeæ, which is wholly American, save two Australian species of the otherwise Chilian genus *Eucryphia*, there are three endemic genera, namely *Vauquelinia* and the monotypic *Pterostemon* and *Lindleya*; *Rubus* numbers about five-and-twenty distinct and varied species; and of the widely spread tribe Potentilleæ of temperate regions there are three shrubby genera peculiar to Mexico and the countries immediately to the north, from Texas to California. These are *Cercocarpus*, *Cowania*, and *Fallugia*. *Alchemilla*, of wide range in temperate and frigid regions, including South Africa and Australia, is present in Andine species; and *Rosa* reaches its southern limit in Coahuila, where there is one endemic species. A second species of *Rosa* is found on the Mimbres in Southern New Mexico, just within our boundary.

Saxifragaceæ.

Nine genera and nineteen species are the numbers of this order. No genus is endemic, but four, *Heuchera* and the monotypic *Lepuropetalon*, *Fendlera*, and *Phyllonoma*, are restricted to America. The first and third find their southern limit in Mexico, while *Lepuropetalon*, a minute herb, ranges from South Carolina to Georgia, Texas, and Sonora, and reappears in Chili and Uruguay; and *Phyllonoma* inhabits Mexico and Colombia. One species of *Deutzia*, an otherwise Himalayan and Eastern Asiatic genus, is an interesting occurrence, though it must be admitted that the genus is not easily separated from the more widely-ranging *Philadelphus*, which is likewise

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* "On the Mimoseæ," Transactions of the Linnean Society, xxx. p. 350.

Mexican. *Hydrangea*, of which one Andine species inhabits Mexico, is common to America and Eastern Asia.

Crassulaceæ.

Conspicuous among Mexican succulent plants are the numerous forms of the section *Echeveria* of *Cotyledon*, of which there are two or three outliers in California and Texas. There is also a considerable number and variety of forms of *Sedum*, a genus of the northern hemisphere extending to the Andes. Some, like *S. dendroideum*, are of shrubby habit; *S. cupressoides* has small closely imbricated leaves like a cypress or lycopod; and several are small annual plants.

Hamamelideæ.

An order which is chiefly Asiatic, and rarer in Africa, and only found in Eastern North America, having its southern limit in Central America, where there are one or two species of *Liquidambar*. This genus inhabits eastern North America, Asia Minor, and Eastern Asia. *Liquidambar* trees are sufficiently abundant in some of the mountain forests of Mexico and Central America to form an appreciable element.

Myrtaceæ.

This order, which is wholly shrubby and arboreous, and eleventh as to number of species among the orders of phanerogams, is widely spread in temperate and tropical regions, though very rare in the north temperate zone. We have only one from North Mexico, and that from San Luis Potosi; about half a dozen inhabit South Florida, one the Bermudas, one Europe, and none temperate China and Japan. On the other hand, they abound in Australasia and temperate South America, while only about fifteen species have been found in South Africa, the most interesting being *Metrosideros angustifolia*; the genus being otherwise Australasian and Polynesian. The Chilian monotypic *Tepualia* is closely allied to *Metrosideros*, and the only Leptosperm in America. We have fifty-eight species of Myrtaceæ (fifty-one endemic) belonging to twelve genera. All the species are restricted to America.

The Australasian Myrtaceæ belong mainly to two tribes almost entirely restricted to the region, and they number about 700 species, belonging to forty genera. In Australia itself there are 660 species, and they constitute the next to the largest order; Leguminosæ alone exceeding them. Berg* estimates the total American Myrtaceæ at 1726 species, 696 of them being concentrated in Brazil; but it should be remembered that he took a very narrow view of species. Sixteen-seventeenths of them belong to the Myrteæ, or true myrtles. He very elaborately tabulates the distribution of the whole of the American Myrtaceæ in the work cited. The almost exclusively tropical tribe Lecythideæ, consisting largely of gigantic trees, many of them having huge woody seed-vessels, is sparingly represented in Central America by four genera and seven species, remarkable among them is the "Cannon-ball Tree," *Couroupita nicaraguensis.*

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* Flora Brasiliensis, xiv. 1, p. 619.

Melastomaceæ.

The greater part of the Melastomaceæ are shrubs, but they present every variety in aspect and duration, from slender annual herbs to tall trees, and they are generally diffused in the tropics, and a few inhabit temperate latitudes; but they are comparatively rare in Africa, and very few have been collected in North Australia. Their greatest concentration in the Old World is in the Malay peninsula and archipelago. One species of *Osbeckia* is undoubtedly wild in Japan; and two or three members of the order inhabit Natal. The suborder Astronieæ and the very large genus *Memecylon* are confined to the Old World; the latter being replaced by *Mouriria* in Tropical America. The chief centre of the suborder Melastomeæ is Brazil, where they are exceedingly numerous and varied. Not less than two thirds, probably, are Brazilian; but as only a portion of them have been elaborated and published, the numbers are not available. Altogether the order comprises 132 genera, and about 1800 species, more rather than less. They abound in the West Indies, and they are not uncommon in Central America and southward to Peru; yet not a single species has been discovered in Chili, and none is found in North-west America. Indeed, with the exception of three, *Heeria subtriplinervis*, *Monochætum calcaratum*, and a species of *Miconia*, collected by Seemann, and vaguely labelled "Sierra Madre," we have no record of any in North Mexico. One genus (*Rhexia*) of several species inhabits the Atlantic States, extending northward to Massachusetts. From the peculiarities of its American distribution this order seems to be a lover of humid regions. It ceases in North Mexico even more suddenly than epiphytal orchids, and it does not penetrate the dry region of western South America. Another remarkable fact is that not one of the genera is amphigean; and the bulk of the American species are comparatively local, although a few are spread over nearly the whole American area of the order, leaving the North-American *Rhexia* out of consideration. Out of 139 species, ninety-two are endemic within our limits, while only two genera out of twenty-nine are so restricted, namely *Centradenia* and *Heeria*: all the rest extending into South America, and twenty-two of them into the West Indies. The following species are widely spread in South America and also occur in the West Indies:—*Pterolepis ladanoides*, *Pleroma longifolium*, *Miconia decussata*, *M. ibaguensis*, *M. impetiolaris*, *M. lacera*, *M. lævigata*, *M. minutiflora*, *M. nervosa*, *M. prasina*, and *M. stenostachya*, *Clidemia dependens*, *C. neglecta*, *Sagræa rubra*, and *Octopleura micrantha*. These features in the distribution of the Melastomaceæ are repeated in the Orchideæ. With regard to altitudinal distribution the Melastomaceæ begin on the sea-coast, but they are rare in our region above 5000 feet; still a few ascend much higher. Thus *Pleroma longifolium* and *P. schiedeanum* were found by Galeotti between 6500 and 8000 feet in the Cordillera of Oaxaca; *Monochætum alpestre* is found in the same mountains at elevations of 8000 to 10,000 feet; and Salvin met with a species of *Monochætum* and a species of *Miconia* at 8300 to 8500 feet on the Volcan de Fuego. *Nepsera aquatica*, an exceedingly common marsh-plant near the sea from Colombia to South Brazil and throughout the West Indies, we have not seen from within our limits, and we had overlooked a record of it from Panama*. To give an idea of the predominance of this order in America, the numbers of species of a few of the larger genera are added:—*Miconia*, 300; *Pleroma*, 125; *Oxymeris*, 85; *Clidemia* and *Ossæa*, 40.

Lythraceæ.

The principal feature of this order is the genus *Cuphea*, which comprises sixty-two species out of the total of eighty-two, and constitutes a conspicuous element in the small shrubby and herbaceous flora of Mexico. It is peculiar to America, ranging from the South-eastern States of North America, through the West Indies and Mexico to Chili and Uruguay, with two main centres—one in Mexico, the other in Brazil. Only four species have been discovered in North Mexico, and one of these reaches Southern Arizona. *Antherylium nudiflorum* is a somewhat anomalous species of the previously monotypic genus, the original species being a native of the West-Indian islands of St. Thomas and Porto Rico.

Onagrarieæ.

These are chiefly herbs, though a few attain the dimensions of trees. *Epilobium* is almost cosmopolitan in distribution, and several other genera range widely; but the order is chiefly American, and strongly characteristic, especially generically, in California and Mexico. It comprises twenty-two genera and about 300 species. Fourteen genera and sixty-six species inhabit California, seven of the genera being represented by only one species each, and several of them are confined to the region. Two, *Gayophytum* and *Boisduvalia*, reappear in Chili only. In Mexico and Central America, nearly all in the former, there are fourteen genera, five of which are endemic, and ninety-seven species, of which sixty-seven are endemic. Eight of the non-endemic genera and seventeen of the species extend into western North America. *Fuchsia* ranges through the Andes to Magellan's Straits, numbering at least fifty species; it is also represented by one species in San Domingo, West Indies, and three or four inhabit the mountains of Brazil; and there are three peculiar species in New Zealand. *Œnothera* is, with the exception of one endemic species in the mountains of Tasmania, peculiar to America, and contains about 100 species, generally spread in the temperate and subtropical parts, both north and south. The presence of these two strongly marked genera in Australasia only beyond America is very remarkable; and further particulars will be found in a paragraph (p. 234) specially dealing with similar phenomena. Quite recently a distinct new species of the otherwise Mexican and Guatemalan genus *Hauya*, which differs from *Fuchsia* in having a woody 4-valved capsular fruit, instead of a fleshy berry, has been discovered in Lower California—a fact the more noteworthy because the general character of the flora is not Mexican.

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* Grisebach, 'Flora of the British West-Indian Islands,' p. 268.

Loasaceæ.

With the exception of the monotypic *Kissenia*, which is widely spread in Africa and Arabia, this order is wholly American. There are ten genera and about one hundred species, having their centre in the Andes. *Mentzelia oligosperma*, a northern species, is found as far eastward as Illinois; *M. floridana* inhabits Florida, and a very few species of *Loasa* and *Mentzelia* occur in South Brazil and Buenos Ayres, otherwise the order is essentially western. Three of the Mexican genera enter California, where they are collectively represented by about a dozen species, including seven Mexican, three of which reach British Colombia. *Mentzelia aspera*, a common Peruvian plant, is abundant in all the islands of the Galapagos group from the sea-shore to the tops of the mountains *. This is also common, and the only species of the order in the West Indies. The Loasaceæ are all herbaceous, and most of them have showy flowers, but the most brillantly coloured of them are armed with exceedingly virulent stinging-hairs.

Turneraceæ.

The Turneraceæ are divided between Africa, including the Mascarene Islands, and America. In this order, as in the Passifloreæ, recent explorations have increased the number of generic forms inhabiting the African region beyond the American, though the number of American species is much the higher. Including the Rodriguez arboreous *Mathurina*, which, however, is hardly generically separable from *Erblichia*, represented by one species in Panama and one in Madagascar, there are six genera in the African region, two of which are also represented in America; whereas in America there are only three, even excepting *Piriqueta* as distinct from *Turnera*. Some of the generic distinctions are, however, not very strong, for Urban †, perhaps rightly, reduces *Erblichia* to *Piriqueta*, and retains *Mathurina*. On the other hand, out of the eighty-four described species, seventy are American, ranging from North Carolina (one species) to Argentina and Uruguay; the greatest concentration being in Brazil, where there are fifty-four species. It is singular that the order is unrepresented in Chili, though it is absent from western North America. Besides the one species that reaches North Carolina, there are two others in South Florida. The affinities of the Turneraceæ are with the Passifloreæ and Loasaceæ. *Turnera ulmifolia* is now very widely colonized in Asia and Africa.

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* Anderson, 'Om Galapagos-Öarnes Vegetation,' p. 94.

† Jahrbuch des königlichen botanischen Gartens . . . . zu Berlin, ii. 1883, p. 78.

Passifloraceæ.

Passiflora is an essentially American genus, ranging from Virginia and Texas through the West Indies and Mexico to Chili and South Brazil, and numbering upwards of 150 species, whereof fifty are within our boundaries, and about twenty of them endemic. The twenty-five species or so in the Old World are widely scattered. *Carica* and *Jacaratia*, constituting the tribe Papayeæ, peculiar to America, are both represented in Mexico.

Cucurbitaceæ.

Out of twenty-four genera six are endemic and six are monotypes, the most noteworthy among the latter being *Hanburia mexicana*; and out of ninety-three species sixty-two are endemic, and the only one recorded as extending beyond America is *Melothria pendula*, which Cogniaux records from near Macao, China. From the locality and other circumstances, it is more than probable that the plant, if actually collected in China, is a colonist there.

Begoniaceæ.

Begonia is a genus of nearly 400 species, widely spread in warm regions, but most numerous in Tropical Asia, Brazil, and Mexico; absent from Chili, North America, Europe, and Australasia*. In Asia the genus extends into the temperate regions as far north as Peking; and the southern limit is in eastern South Africa. Only two species have been collected in North Mexico—one in San Luis Potosi, and a very distinct one recently in Chihuahua. As in most large genera, the species are local. The only other genera are:—*Begoniella* of three or four northern Andine species, and *Hillebrandia* a monotype endemic in the Sandwich Islands.

Cactaceæ.

The members of this order vary in size from the lowly species of *Mamillaria*, many of which merely carpet the earth or rock, to the gigantic species of *Cereus*, the larger of which attain a height of fifty to sixty feet, with correspondingly thick trunks. They are mostly destitute of true leaves, but they present an infinite variety in shape and in the hairy and prickly appendages of their stems; and the flowers are nearly always brightly coloured, even if small, and many of them are large and brilliant in the extreme. Red and yellow of numerous shades and white, either separately or variously combined, are the colours; blue being apparently quite absent.

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* Leaves of what may prove to be a *Begonia* have been collected in North-western Australia.

Until recently it was supposed that all the Cactaceæ in the Old World, except *Rhipsalis cassytha*, which is also American, were colonists descended from American ancestors; in other words, that there was not a single species of the order peculiar to the Old World. Now we may say that the order, with the exception of one or more species of *Rhipsalis*, is wholly American, for a very distinct species of this genus has been found in Madagascar *, and probably two or three other forms in the Kew Herbarium from Africa and Madagascar will prove specifically different from *R. cassytha*. With regard to the claims of *Opuntia Ficus indica* and one or two allied species to be indigenous in the Mediterranean region, adverse opinions have been enunciated; yet there seems no valid reason to doubt their American origin, seeing how they have spread in South Africa and elsewhere within the knowledge of man, and Mr. A. DeCandolle's special researches confirm this view †. The general dispersion of *Rhipsalis cassytha* in Tropical America, Africa, the Mascarene Islands, and Ceylon (where it is "certainly indigenous" ‡) is remarkable; but its wide area may be due to the agency of birds, as it produces a profusion of small viscid berries. In relation to the distribution of this order it should be stated that we regard the Galapagos as belonging to the American region. One species of *Opuntia* and one species of *Cereus* have been collected in these islands; and Anderson remarks, "Sine dubio plures adsunt species Cactearum, his insulis propriæ, quas quidem observavimus ipsi, nec tamen ob angustias temporis eas rite colligere vel depingere licitum fuit. Quatuor vel quinque certe distinctas saltem vidimus" §.

Bentham and Hooker || distinguish only thirteen genera of the Cactaceæ; but it seems probable, considering the small amount of material they had under examination, that a larger number of types merit this rank. Eleven of these genera are represented within our limits; two of them being monotypic and restricted to Mexico. Upwards of a thousand proposed species have been described; but, as explained elsewhere ¶, a large number of them are very imperfectly defined, many of them probably synonyms, and comparatively few of them based upon preserved specimens.

Mexico is undoubtedly the centre of the Cactaceæ, as will presently be shown by figures, and the forms are exceedingly numerous; and it is possible that as many species as have been proposed actually exist; yet for purposes of comparison it has been considered desirable to deduct about one fifth of them, thus bringing the total down to 500. Even this number may be too high, though not so much so as to affect any question of distribution. One thing is certain, that hybrids are not uncommon, and

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* Baker in Journ. Linn. Soc. xxi. p. 347.

† L'Origine des Plantes Cultivées, p. 218.

‡ Thwaites, 'Enumeratio Plantarum Zeylaniæ,' p. 129.

§ Om Galapagos-Öarnes Vegetation, p. 95.

|| Genera Plantarum, i. p. 846.

¶ *Huj. op.* i. p. 501.

intermediate forms connecting others previously held to be distinct species have been very largely imported *.

It is impossible to form an approximate estimate of the number of species of Cactaceæ in South America, where they are generally dispersed up to a high latitude, and where in certain regions, as in Chili and some parts of Peru, they abound to such an extent as to be the greatest scourge and obstacle to travellers that exists. Judging, however, from the numbers given for certain parts, species are not very numerous, though individuals are. Thus, for the whole of Chili Philippi enumerates only fifty-five species †; and the Cactaceæ of this part of South America are perhaps better known than those of any other area. Grisebach ‡ describes seventeen as growing in the British West Indies, and he enumerates fifteen for Cuba §. Of course it is not assumed that these numbers include nearly the whole of the species existing in these islands. Watson ‖ records twenty-nine species from California, chiefly "confined to the south and south-eastern districts." In 1856 Engelmann had cognizance of the occurrence of 117 species within the United States territories ¶, and subsequent discoveries have not greatly augmented this number.

Turning to the general distribution of the order in America, it is found to be mainly western, especially in the northern part of the continent. Excluding two species of *Cereus* found in the Keys, South Florida, the order is represented east of the Mississippi by only one genus, *Opuntia*, and four or five species. The latitudinal range of the order is very great, reaching at least the Chonos archipelago about 45° S. on the western side; and Darwin collected *Opuntia darwinii* at Port Desire, 47° S., and observed the same at Port St. Julian in 49° S.**. It is the same genus that reaches the northern limit of the order. Three species, according to Macoun ††, occur in British North America; one as far eastward as Pelee Point, Lake Erie; and the others in British Columbia, Assiniboine, Saskatchewan, and Athabasca, reaching the Peace river in 56° 12′ lat., "where it grows on the arid clay slopes exposed often to a temperature of 55° below zero." The altitudinal range of the order as exemplified in Mexico offers similar extremes, being from the sea-coast up to an elevation of 13,000 feet. Zuccarini ‡‡ and Ehrenberg §§ give the fullest details of the size, distribution, habitats, &c. of the

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* Förster's 'Handbuch der Cacteenkunde,' zweite Auflage von T. Rümpler, Vorwort, p. viii.

† Catalogus Plantarum Chilensium, p. 91.

‡ Flora of the British West-Indian Islands, p. 300.

§ Catalogus Plantarum Cubensium, p. 116.

‖ Botany of California, i. p. 242, ii. p. 449.

¶ Proc. Am. Acad. iii. pp. 259–311, 345, 346.

** Henslow in Jardine's Mag. Zool. & Bot. i. p. 466.

†† Catalogue of Canadian Plants, p. 177.

‡‡ Muench. Abhandl. ii. pp. 597–742.

§§ Linnæa, xix. pp. 337–368.

Cactaceæ. On the authority of the former they ascend to nearly 15,000 feet near the equator. As the altitudes of several of the higher mountain species are given in another place (in the sketch of the mountain-flora of Mexico, p. 286), it is unnecessary to give the particulars here. The nature of the strata in which cactuses grow is as various as the localities they inhabit. Some flourish in the sands of the sea-shore; others in clay; others in loam; others in sandy and stony wastes; others in grassy pastures; whilst many grow on rocks or in crevices of rocks. In some districts they grow associated with other plants, forming a mixed vegetation; in others they have almost or quite exclusive possession of wide areas. Ehrenberg, who nearly half a century ago spent many years in Mexico, chiefly in the States of Mexico and San Luis Potosi, and was specially engaged in sending cactuses to Europe at a period when they were greatly in vogue among cultivators, mentions particularly the Mesillas near the Rio Grande Aquicalco, the Cardonal, and the valleys of Zimapan and Ixmiquilpan as belonging to the latter category.

Umbelliferæ.

The great development of the genus *Eryngium* is the main feature of this order in Mexico; but we refer to it here more especially to direct attention to the imperfectly known plants which we have described under the names *Asteriscium flexuosum* (vol. i. p. 559, t. 32), and *Oreomyrrhis*? *gracilipes* and *O.*? *planipetala* (i. pp. 567, 568, tt. 33, 34). Although the specimens are insufficient to determine the genus with certainty, the plants are so wholly distinct from anything previously described that they were figured for the purpose of bringing them into notice. *Ottoa œnanthoides* is a very singular monotypic member of this order inhabiting the Andes of Mexico and Central and South America, at elevations of 10,000 to 13,000 feet. It is a low herb with fistular, jointed leaves.

Caprifoliaceæ.

Associated with the widely-diffused genera *Sambucus*, *Viburnum*, and *Lonicera* we have the endemic monotypic *Microsplenium*, the peculiarly North-American *Symphoricarpus*, and the distinct genus *Abelia*, which is common to the Himalayas, China, and Japan.

Rubiaceæ.

This order stands third from the largest order of phanerogams, with about 340 genera and between four and five thousand species, generally dispersed, except in the coldest regions. Our numbers are:—seventy-four genera; nine endemic and forty-five others restricted to America, while fourteen range widely; 385 species, 295 of which are endemic and eighty-eight others restricted to America, leaving only two that extend beyond, namely, the widely-spread *Geophila reniformis* and *Nertera depressa*, which also inhabits the Andes and southward to Fuegia, Tristan da Cunha, and Australasia.

Four genera are common to Africa and America only; these are *Sabicea*, *Bertiera*, *Diodia*, and *Mitracarpum*; and there are no fewer than seven endemic monotypic genera. Excluding the cosmopolitan tropical genus *Psychotria*, the characteristic genera *Rondeletia* and *Bouvardia* are the most numerous in species; and *Deppea*, *Hoffmannia*, *Houstonia*, and *Crusea* are other genera having their greatest development within our boundaries. The Rubiaceæ are one of the few dicotyledonous orders in which the north-eastern extensions considerably exceed the north-western; the numbers being thirteen genera and twelve species against six genera and eight species.

Compositæ.

In his essay on the "Classification and Distribution of the Compositæ"[*] and in Bentham and Hooker's 'Genera Plantarum,' the late Mr. Bentham divided the Compositæ into thirteen suborders and 766 genera; and he estimated the species at 9800. These numbers constitute 10·1 per cent. and 10·2 per cent. respectively of the genera and species of all phanerogamic plants as defined and estimated in the 'Genera Plantarum.' Since the date of these publications (1873) upwards of fifty new genera of Compositæ have been proposed and described, many of them American, and founded by Dr. A. Gray; and the total may now be fairly put at 800. As to the total number of species 10,000 is certainly not too high an estimate, as may be gathered from the synopses of species of various parts of America: Brazil, 150 genera and 1280 species[†]; America, north of Mexico, 221 genera and 1576 species[‡]; Mexico and Central America, 215 genera and 1518 species; Andes, genera 65, species 470[§]; and Chili about 1000 species[||]. The last, and our own also, perhaps, may be a little too high, otherwise the figures are tolerably accurate, and the aggregate of species is 5844. The number of species recorded from Cuba is 184, and from the British West Indies about 150. The countries given do not, of course, comprise the whole of America; but after making all necessary reductions for bad species and extensions of species into two or more of the areas, there would remain at least fully 5000 species for the whole of America against Bentham's estimate of 4525. This will be evident from the fact that less than 200 of the species in our enumeration extend north of Mexico, so that about 2900 species inhabit North and Central America; 1030 of the Brazilian species are set down as endemic; and the Andine are so almost without exception. The foregoing figures exclude Guiana, Venezuela, and tropical western South America, as well as the region east of the Andes from Bolivia and Argentina to Patagonia, and northward on the eastern side to Uruguay; and at a low computation a thousand inhabit these countries, for in a fragment of the 'Flora of Argentina' Grisebach enumerates 375 species *.

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[*] Journal of the Linnean Society of London, xiii. pp. 335–577.

[†] Baker in 'Flora Brasiliensis,' vi. 3, p. 408.

[‡] Gray, 'Synoptical Flora of N. America,' ii. 1, p. 465.

[§] Weddell, 'Chloris Andina,' i.

[||] Philippi, 'Catalogus Plantarum Vascularium Chilensium.'

Whether the other orders collectively have increased in the same ratio, since the publication of the first part of the 'Genera Plantarum' in 1862 up to the present time, as the Compositæ, is not readily ascertained; but, judging from a cursory examination of the number of new genera intercalated in a copy of the 'Genera Plantarum' in the Kew Herbarium, and of a number of recent monographs of orders, it is probable that they have. To give an example, C. B. Clarke's monograph of the Cyrtandreæ has considerably more than doubled the number of species previously known †. Nevertheless, it may be assumed that the Compositæ still maintain the proportion of at least 10 per cent. of the phanerogamic flora of the world. In Mexico and Central America the Compositæ constitute 13 per cent. of the phanerogams, and they represent 28 per cent. of the genera of the order retained by Bentham and Hooker, and 15·5 per cent. of their computation of the species. There are no available data for comparisons with the whole phanerogamic flora of other parts of America; but thanks to Dr. A. Gray's marvellously sustained energy in descriptive botany, we have now, in the work cited above, all the figures up to date for the Gamopetalæ. In America, north of Mexico, the Compositæ constitute 42 per cent. of the genera and 47 per cent. of the species of the Gamopetalæ, while in Mexico the percentages are respectively 33 and 37·8. Turning again to Bentham's essay we find that his total of species for the Old World, excluding Insular Regions, is about 400 in excess of that for America and of genera thirty-three fewer, and his Mediterranean region is also numerically the highest in species; yet the number of genera is 100 less than in his Mexican region, which, however, does not correspond to ours, but includes the countries to the north from Texas to the Pacific, embracing the southern half of California. As thus circumscribed, this region undoubtedly possesses the densest aggregation of Compositæ, both in relation to area and total number of phanerogams. It is true that in many smaller areas in various parts of the world the percentage of Compositæ is much higher, Mr. A. DeCandolle ‡ tabulates the dominant orders for a large number of areas, insular and continental; most of them, however, are of small extent, and the figures for the larger ones are drawn from collections representing only fragments of the floras. Thus a portion of Hartweg's collections in Mexico and Guatemala yields 16 per cent. of Compositæ; Humboldt and Bonpland's plants from the region of Quito 22 per cent.; and Gay's plants from Central and Northern Chili 21 per cent., and so on. In insular floras like that of Juan Fernandez it is even higher. DeCandolle makes it 25; but we make it 31·4 per cent. of the certainly indigenous

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* Symbolæ ad Floram Argentinam.

† Monographiæ Phanerogamarum, v. 1883.

‡ Geographie Botanique Raisonnée, ii. pp. 1189–1233.

plants*, and that of St. Helena 26·3 per cent. Mr. J. Ball states† that in a small collection made by him in the upper valley of the Rimac, on the Peruvian Andes, the Compositæ amounted to nearly a quarter of the whole; and he continues:—"But the proportion in my list for the higher or alpine region is a full third of the whole, and, as far as I can judge, this is not far from the truth for the Andes of Peru and Bolivia." But these very high percentages are only obtained where the flora is relatively poor in species; and certain parts of the Mexican region would doubtless yield similar results. Ball says that the proportion of 25 per cent. of Compositæ seems to prevail throughout the temperate regions of South America. We find by a rough calculation of the pages occupied by the Compositæ in Philippi's catalogue of the plants of Chili, that they form about 19·5 per cent. of the phanerogams; a higher proportion than we had expected. The only large area of which there are published data for comparison is Australia. Baron Mueller‡ makes the total number of Australian phanerogams 8566, and the Compositæ 535, which gives a percentage of 6·2. In South Africa the Compositæ are proportionately much more numerous; and the "Composite Region" of Bolus §, a central area of 4000 to 5000 feet elevation sloping towards the Orange River, is especially so, amounting to 23·6 per cent. But the great abundance of the Compositæ is only fully realized when we know that the order next in predominance, the Gramineæ, only reaches 8 per cent.; and we are told that the preponderance of individuals is immensely in excess of the numerical proportion of the species. Unfortunately there are almost no published data respecting individual development in the Mexican flora.

A brief analysis of the composition and distribution of the Compositæ of the Mexican flora must terminate this general sketch.

Eleven out of thirteen of the suborders are represented; the other two, the Calendulaceæ and Arctotideæ, are confined to the Mediterranean region and Africa, and almost exclusively to South Africa, where they number 320 species. The essentially American Helianthoideæ have their greatest concentration in Mexico and amount to 32 per cent. of the species and two fifths of the genera of the whole of the Compositæ of the region. Twenty-three of the genera and 400 of the species are endemic; and fifty of the remaining genera are restricted to America, thus leaving only twelve that extend beyond America; and only three of the species inhabit other countries. The average number of species to each genus is only about 5·7, and the only large genera are *Verbesina*, with forty-one species, and *Zexmenia*, with twenty-nine species. Numerically, in species at least, the Eupatoriaceæ come next to the Helianthoideæ, the number of genera being only a quarter as many. A third of the genera are endemic, and the rest are restricted to America, except the widely diffused *Eupatorium*, one species of *Aloma* in Polynesia, and one species each of *Ageratum*, *Adenostemma*, and *Mikania*, now having a wide range. It is remarkable that these three genera are only represented in the Old World by one common American species each; the inference is that they originally spread from America, especially as they colonize freely. *Eupatorium* (149 species) and *Stevia* (68 species) contribute more than four sixths of the species of this suborder, and there are thirty-seven species of *Brickellia*, twenty of *Ageratum*, and fourteen of *Mikania*, leaving forty-one species between the other seventeen genera. The Asteroideæ comprise 208 species, referred to twenty-three genera, only one of which is endemic; but a large proportion only extend into western North America. *Baccharis*, an exclusively American genus, is the largest and most interesting. It is diœcious and comprises about 300 mostly shrubby species, spread all over America, except the colder northern regions, though much more abundant in South America than North. Forty-eight species are recorded from Mexico and three from Central America. Some of the proposed Mexican species are doubtless bad; on the other hand, more may be expected to occur in Central America. *Erigeron* numbers twenty-eight species, and of the characteristic North-American *Aster* there are nominally seven. The equally characteristic North-American *Solidago*, of which Gray describes seventy-eight species, extends as far as South Mexico, though the species are few. Next come the Helenioideæ with thirty-eight genera, ten of them endemic, and 173 species, whereof 116 are endemic. Excepting one species of *Flaveria* in Australia, one species of *Jaumea* in tropical Africa, and the South-African monotypic *Cadiscus*, the Helenioideæ are American, having their headquarters in Mexico. Twenty-four of the genera extend into western, and half that number into eastern North America; ten of them are monotypic, and there are twenty species of *Pectis*, eighteen of *Porophyllum*, seventeen of *Tagetes*, and twelve of *Hymenatherum*. The Senecionideæ, with only eight genera, including three endemic, number 118 species, of which 106 are endemic. *Senecio* contributes ninety-eight species, all except five endemic. Besides this widely-spread genus only one other, *Erechthites*, extends beyond America, and it only to Australia and New Zealand. All three of the endemic genera are monotypes. Here follow the Vernoniaceæ with nine genera, including one endemic monotype, and sixty-four species, of which forty-eight are endemic. *Vernonia*, a widely spread tropical and subtropical genus of about 400 species, represents nearly five tenths of this suborder in our region. In Brazil it ranks second both in genera and species. Next come the Mutisiaceæ, which are very thinly represented in all of Bentham's Old-World regions; but they are at least six times as numerous in America, chiefly in South America, culminating in Chili. Within our limits there are six genera, all of which extend to the Andes; and forty-eight species, which, with the exception of seven extending a short distance into western North America, are endemic. Of *Perezia*, the largest genus, there are twenty-six species. Five genera and ten species of this suborder occur within the limits of the United States flora, and *Chaptalea tomentosa* inhabits the Atlantic side as far north as North Carolina. The Inuloideæ are represented by eight genera, none endemic, and forty-five species, whereof thirty-five are endemic. Five of the genera extend beyond America; four have a wide range, and *Gnaphalium* is the largest with thirty species. There remain the Cichoriaceæ, Cynaroideæ, and Anthemideæ, with an aggregate total of sixteen genera, not one of which is endemic, and only seven are restricted to America. The species number fifty-four, of which thirty-two are endemic, twenty others restricted to America, and two have a wide range.

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* 'Challenger' Expedition, Botany, i. 2, p. 54, and 3, p. 19.

† Journ. Linn. Soc. xxii. p. 10.

‡ Systematic Census of Australian Plants. Third Annual Supplement, 1886, p. 6.

§ Sketch of the Flora of South Africa: Official Handbook to the Indian and Colonial Exhibition, 1886, p. 313.

A glance at the proportional distribution of the Compositæ in Mexico and Central America is sufficient to convince one that not half of those of the southern districts are known. The figures are:—North Mexico, 629; South Mexico, 977; Guatemala, 123; Nicaragua, 103; Costa Rica, 101; and Panama, 73. With regard to genera it is interesting to note that whereas 150 occur in North Mexico there are only 157 in South Mexico, where there is a third more species. An examination of the Table (p. 212) teaches us that twelve of the larger genera of Compositæ count, collectively, 634 species, whereof 551 are endemic.

One more point of interest deserves a few lines, and that is the extension of genera and species into other parts of America. It would carry us to too great a length to attempt to distinguish which of these should be regarded as extensions *into* our territories. Of the Mexican genera of Compositæ 107 are also in western North America, 64 in eastern, 104 in South America, and 58 in the West Indies. The distribution of the species indicates still more markedly the western connection. Thus 182 extend into western North America against 38 into eastern; and 111 into South America against 65 into the West Indies. Further, the southward and eastward extension of species exhibits the following proportions:—both the West Indies and South America, 38 species; West Indies only, 20 species; western South America only, 46 species; eastern South America only, 12 species; eastern and western South America, but not the West Indies, 14 species. The proportion of species extending to the West Indies is small, and there the Compositæ form a comparatively small proportion of the vegetation.

Campanulaceæ.

These are tolerably numerous, but they are mostly members of genera having a greater concentration elsewhere. Thus the characteristic Andine *Burmeisteria*, *Centropogon*, and *Siphocampylus* are represented by a few species; one species of the Californian genus *Nemacladus* extends into Northern Mexico; and the widely-spread *Campanula rotundifolia* is found in North Mexico, the southern limit of the genus in America. *Heterotoma* is a curious endemic genus; and *Lobelia* counts about thirty species, or nearly half the total of the order.

Vacciniaceæ and *Ericaceæ.*

There is no endemic genus of either of these orders, and the species number only thirty; but with one exception the species of the Vacciniaceæ are endemic, and forty-nine out of fifty-eight Ericaceæ are not known to occur outside of our boundaries. It is noteworthy, too, that only four genera out of thirteen belonging to the two orders are restricted to America. The special feature of these plants is that they form a very prominent part of the shrubby element of the alpine flora. Associated with such Andine genera as *Macleania*, *Satyria*, and *Cavendishia* are the wider spreading *Vaccinium*, *Gaultheria*, *Arctostaphylos*, and *Arbutus*. *Pernettya* and *Bejaria* have a wider range in America, and the former reappears in New Zealand and Tasmania; the latter is the only one in our flora belonging to the tribe Rhododendreæ. Of the herbaceous Pyroleæ, two out of three genera, *Pyrola* and *Chimaphila*, find their southern limit in the mountains of South Mexico and Guatemala respectively.

Lennoaceæ.

A singular group of herbaceous root-parasites, of which three genera and four or five species are known. *Pholisma arenarium*, the only species found outside of Mexico, is a native of the country near San Diego and Monterey, California, and apparently very local. Indeed all of them seem to be rare and local. In habit and aspect they are not unlike the Monotropeæ and Orobanchaceæ, from which they differ in having a multicellular ovary and other characters. There is no other order of parasitical plants so restricted in area.

Asclepiadeæ.

This chiefly tropical order is strongly developed in South Africa, and more so in North America than in any other north temperate region, especially in the Texano-Mexican region. North of Mexico there are nineteen genera represented by nearly 100 species; from North Mexico we have already fifty-two species belonging to ten genera, and from South Mexico 100 species belonging to seventeen genera. The tropical part of our area would seem to be singularly poor in this order, though no doubt many more exist than have been collected. In the West Indies, too, there are not many; yet they abound in Brazil. Two of our genera, *Vincetoxicum* and *Marsdenia*, have a wide range; of *Asclepias* there are two African species; the rest are restricted to America and three of them to Mexico. Upwards of eighty of the Mexican species belong to the genera *Asclepias* and *Gonolobus* in about equal numbers. Six genera exhibit a north-western extension and the same number a north-eastern, while the numbers of species are respectively twenty-three and four. *Trichosacme*, *Lachnostoma*, *Polystemma*, *Fimbristemma*, *Nephradenia*, *Enslenia*, *Blepharodon*, *Melinia*, and *Oxypetalum* are each represented by a single species, though only two of these genera are monotypic.

Gentianeæ.

In this order, as in many others, temperate wide-ranging genera overlap and intermingle with American; thus *Leianthus* and *Lisianthus* with *Gentiana* and *Erythræa*; and the widely-spread *Gentiana amarella* reaches North Mexico. *Geniostemon* is the only endemic genus. *Voyria* is a genus of small leafless herbs widely spread in tropical America, and represented by one endemic species in west tropical Africa.

Polemoniaceæ.

Polemonium is represented by a few species in temperate Europe and Asia and *Phlox* in North-eastern Asia, otherwise the order is wholly American and chiefly western, extending southward to Chili. North of Mexico there are four (or five, if *Collomia* be retained) genera and 133 species, whereof sixty-three are Californian. The genus *Phlox* is the only one common in the Atlantic States, where there are ten or twelve species. In Mexico and Central America there are seven genera, including the two which extend to the Old World, and the endemic monotypic *Bonplandia. Cobæa* reappears in the Andes, and the remainder are both North American and Chilian. With few shrubby exceptions, this order is herbaceous.

Hydrophyllaceæ.

This wholly herbaceous order is essentially American, and especially numerous in California, where there are twelve genera and sixty-one species out of totals of seventeen and 150. Excepting the singular South-African monotypic *Codon*, and the rare Japanese monotypic *Ellisiophyllum*, all the genera are American, and fourteen out of fifteen are restricted to America. Five genera and fifteen species occur in the Atlantic States; but of these *Nama* is only represented in South Forida by the widely-spread *N. jamaicense*; and all the genera except *Hydrolea*, the one widely spread in the tropics of the Old World, are also western. Three of the northern genera extend to Chili, where there are about eight species, including *Phacelia circinnata*, which ranges from British Colombia to the Straits of Magellan. Within our limits there are five genera, including *Hydrolea*, not one of which is endemic; and thirty-two species, of which sixteen are endemic in the northern division, and eleven extend into North-western America, against one into eastern. Three of the commoner species extend to the West Indies, where only one endemic species of the order, *Hydrolea nigricaulis*, a Cuban plant, is known to exist; and one of the same species reaches Brazil, where only *Hydrolea* and *Wigandia* are represented. Seventeen of the Mexican species belong to *Nama*; and only *Hydrolea* and *Wigandia* have been found south of Honduras. The latter genus is restricted to the mountains of the tropical parts of America, where, however, it has a wide range.

Boragineæ.

Although this order is represented by 120 species and seventeen genera, it offers little for remark here, no genus being endemic and ten of them having a wide range. About half of the species are endemic and considerably more than half are South Mexican, including both the woody and the herbaceous elements. The occurrence of the monotypic *Harpagonella* near Tucson, Southern Arizona, is curious, as the only other locality known for it is Guadalupe Island, off Lower California. *Omphalodes*, otherwise an Old-World genus, is represented by two somewhat anomalous species in North Mexico.

Convolvulaceæ.

The number and variety of species of the genus *Ipomœa* is the only noteworthy feature of this order. Including *Pharbitis*, *Quamoclit*, *Exogonium*, *Mina*, *Batatas*, and other proposed genera, *Ipomœa* includes upwards of 300 species, of which about eighty inhabit Mexico and Central America. They present great diversity in habit from slender twining herbs to the arboreous form, as in *I. murucoides* and *I. arborescens*, the latter being described as *arbor procerrima.*

Solanaceæ.

Although generally dispersed in tropical and temperate regions, this order is preeminently American, fifty-two out of sixty genera being represented, and forty-five of them peculiar. *Solanum* itself, one of the largest genera in the vegetable kingdom, numbering between 700 and 800 species, has nearly the same range as the order, and is common in most warm countries, even where the species are few; but by far the largest aggregation of species is in America. Brazil alone possesses about 170; Chili about fifty, and Mexico and Central America at least 100, after deducting about forty which are either doubtful or better placed as varieties of others. After making the deduction indicated and eliminating for the same reasons an equally large proportion of the proposed species of *Physalis*, *Cestrum*, and other genera, and leaving out the genus *Capsicum* altogether, there are still 230 species of Solanaceæ left within our limits, belonging to twenty-six genera, two of which are endemic, and nineteen of the remaining twenty-four are restricted to America. Only nine of the species extend beyond America, and these are all widely diffused plants, mainly through cultivation. Apart from the cultivated species of *Nicotiana*, which are now so widely colonized through cultivation, and for other reasons to be left out of consideration, certainly indigenous species are found only in America, Australasia, and Polynesia. A large number of the American genera of Solanaceæ are wholly or largely western, ranging from California, where, however, there are comparatively few, and no endemic genera, and Mexico to Chili, where the order is largely developed. Of our genera ten and of our species thirty-one have a north-western extension while the north-eastern extensions are five and two respectively.

Scrophularineæ.

This order is generally spread, yet it is perhaps nowhere so strongly represented generically as in Mexico, where there are forty-two genera, nine of which are endemic; twelve others are wholly American, and twenty-one extend to other countries. The last number is proportionately higher than in the majority of the large orders of dicotyledons. The total number of genera in the order is about 170 and the species are estimated at nearly 1900. A. DeCandolle * calculated the percentages in numerous floras, large and small, of several of the larger orders, among them the Scrophularineæ. In the first part of Bentham's 'Plantæ Hartwegianæ,' collected in Mexico and Guatemala, and numbering 630 species, chiefly from temperate and subtropical regions, he found that this order constituted 6 per cent.; but so high a proportion can only be regarded as accidental, though no doubt it is very much higher for these regions than for the entire area. Martius † calculated that the Scrophularineæ constituted about 1·5 per cent. of the species of the Brazilian phanerogamic flora, and this is exactly the proportion for the whole of Mexico and Central America. Six of the endemic genera are monotypic; and equal numbers of the whole extend to eastern and western North America; but those of north-eastern extension contain a larger proportion belonging to genera of extra-American distribution. The Andine and Antarctic American genus *Calceolaria* has its northern limit in South Mexico. This is also represented in the Falkland Islands and New Zealand. *Pentstemon*, with the exception of one species in North-eastern Asia, is exclusively American and chiefly western; and of the twenty-one species in Mexico two reach Guatemala. The South-African genus *Phygelius*, however, is so near *Pentstemon* that if it were from the same country it would probably have been put in the same genus. The other large genera are, *Castilleja*, which has a wide range in America and one of the species is also found in North-eastern Asia, and the endemic *Lamourouxia*. Coming to the species, we find that only nine out of 170 extend beyond America, and 103 are endemic within our boundaries.

Gesneraceæ.

All the tribe Gesnereæ and the subtribe Columneæ of the tribe Cyrtandreæ are American, ranging from South Mexico and the West Indies southward to Chili and South Brazil. It is true that *Achimenes scheerii* is recorded from Chihuahua in our enumeration, but on reference to the place of publication we find that it was received through Mr. Potts of Chihuahua; therefore it is possible, in fact most probable, that he obtained it from South Mexico, as it would otherwise be widely isolated from the rest of the order. Twenty genera of this group are Mexican or Central American and three of them are endemic in South Mexico and Guatemala; and 133 out of 144 species are endemic. Two genera belong to the tribe Eucyrtandreæ, one of them being chiefly Asiatic. Nearly all are herbs with showy brightly coloured flowers.

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* Géographie Botanique, ii. pp. 1189–1250.

† Flora Brasiliensis, Scrophularineæ, p. 332.

Labiatæ.

The enormous development in Mexico of the widely-spread genus *Salvia* is the most striking feature in this order. It is the third from the largest genus in our flora, and the species are perhaps better defined than those of the genera surpassing it in number. It is noteworthy that only two genera out of twenty-nine are endemic, and of these *Dekinia* is obscure, and we probably have it under some other name. Eleven of the genera range widely and three others extend beyond America. *Hyptis*, a genus of about 250 species, all of them American, and four or five of them now more or less widely spread in other warm countries, though probably of American origin, is also strongly represented; but about 200 of the species inhabit Brazil. Many of the southern species are shrubby and two or three of them trees thirty to forty feet high, and the largest members of the order in the world.

Acanthaceæ.

Eleven out of thirty-eight genera are endemic; fourteen others are restricted to America; eleven are widely dispersed; *Siphonoglossa* is common to South Africa, and one species of *Tetramerium* inhabits the Galapagos. Upwards of two thirds of the species are endemic, and only one, *Nelsonia campestris*, is found out of America, and this is almost cosmopolitan in the tropics.

Nyctagineæ.

Twenty-five genera are referred to this order, two of them founded since the publication of Bentham and Hooker's 'Genera Plantarum;' one of them, however, is described as anomalous. Except this, which is African, and *Timeroya*, a New-Caledonian genus, all of the genera are American, and all save three endemic; hence the order may be regarded as specially American. *Pisonia*, a large genus of trees and shrubs, is widely diffused, as also the herbaceous *Boerhaavia*, and one species of *Oxybaphus* is endemic in the Himalayas. The total number of species has been estimated at 215; sixty of them belonging to *Pisonia* and thirty to *Neea*, of which we have seen only fragmentary specimens of two or three species from within our limits. Fourteen genera, two endemic, and fifty-four species, twenty-three of which are endemic, are noted from Mexico and Central America, but by far the greater part from Mexico. Of the remaining twelve genera nine are restricted to America, and eight of them extend into western North America as against three into eastern. Eight of the western genera are peculiar to the region; that is to Texas and westward and northward. And we have thirty-six species, belonging to nine genera, from North Mexico. Here, then, in North Mexico and Texas to Arizona is the greatest generic concentration of the order; for California possesses only eleven species, belonging to four genera, one of them an endemic monotype.

Phytolaccaceæ.

This small, though widely spread and somewhat heterogeneous order is represented by eight out of twenty genera and ten species. These include the new monotype *Phaulothamnus* recently discovered in North Mexico. Excluding *Phytolacca* itself, the genera are peculiar to America and five of them are monotypes. *Agdestis*, one of them, is Texano-Mexican, and *Stegnosperma* is found in Sonora, Lower California, Guatemala, Cuba, and San Domingo.

Polygonaceæ.

Excluding the Eupolygoneæ and the Rumiceæ, which are abundantly represented by the widely-spread genera *Polygonum* and *Rumex*, this order is essentially American. Indeed all the genera of the tribes Eriogoneæ, Kœnigieæ, Coccolobeæ, and Triplarideæ are American, and fifteen out of nineteen are peculiar to America. The exceptions are one species of *Kœnigia* in the arctic regions and one in the Himalaya; the genus *Muehlenbeckia* in Australasia and Polynesia, one species of *Brunnichia* in west tropical Africa, and one imperfectly known species of *Symmeria* in Senegambia. The Eriogoneæ are almost wholly western, chiefly Californian, with a few Chilian species of the same genera. *Eriogonum* itself comprises about 100 species, all North American; two of them are found east of the Mississippi river; both inhabit Florida and one extends to South Carolina. Upwards of fifty are peculiar to California; and of the nineteen found in Mexico fifteen are merely southward extensions of species more abundant north of Mexico. Only one, *E. undulatum*, has been discovered in South Mexico; and it is probably rare, for we have seen only one imperfect specimen, collected by Galeotti at Real del Monte at an elevation of 8000 feet. The Californian and Chilian genus *Chorizanthe* is represented by one species on the Gila, though perhaps not within our limits. Besides the genera mentioned there are six others of this affinity in California, two of which reappear in Chili. Passing to the Coccolobeæ we have the showy endemic genus *Antigonon*, *Campderia* (which is also Brazilian), a few species of the large tropical-American genus *Coccoloba*, and two species of *Muehlenbeckia*. In Triplarideæ we have the endemic monotypic *Podopterus*, and two species each of *Triplaris* and *Ruprechtia*; both more numerous in species in South America and the former represented in the West Indies.

Piperaceæ.

Both *Piper* and *Peperomia*, generally diffused tropical genera, are numerous in Mexico and Central America, yet we suspect that the two hundred or more species described are susceptible of very considerable reduction. *Houttuyina*, the only other genus, is common to Mexico and Texas westward to California, the Himalayas, China, and Japan.

Laurineæ.

Only thirty-six species, several of them imperfectly known, are recorded from within our limits; and Grisebach describes only twenty-six in his 'Flora of the British West-Indian Islands,' whereas the number in Brazil is about 320. In all probability, however, further explorations in Central America will yield a considerable addition to this order. *Litsea glaucescens*, a very variable species, is perhaps the commonest in the Mexican region, where it rises to an altitude of 8000 feet. *Umbellularia californica* is the only member of the order inhabiting western North America; and in the Atlantic States there are seven species belonging to five genera.

Euphorbiaceæ.

This order is seventh in numerical strength of species within our limits, and sixth in the whole world. Our 368 species, of which 240 are endemic, are largely made up by the widely-spread genera *Euphorbia*, *Jatropha*, *Croton*, and *Acalypha*; these four contributing no fewer than 246. Altogether we have thirty-two genera, two of them endemic, and sixteen extending beyond America. *Pseudocroton* is an endemic monotypic genus in Nicaragua, and *Dalembertia* is a small genus restricted to Mexico. The genus *Euphorbia* presents a great variety, from the gorgeous *E. pulcherrima* down to minute annual herbs.

Cupuliferæ.

Taken in the broad sense, that is to include the Betuleæ and the Coryleæ, this order comprises ten genera and about 400 species, generally dispersed in the northern hemisphere, and extending to the mountains of tropical Asia and America. One genus only, *Fagus*, reappears in the extratropical regions of South America, Australia, and New Zealand, where it constitutes an important element of the forests. The genera represented within the limits of this work are *Alnus*, *Carpinus*, *Ostrya*, and *Quercus*; yet, with the exception of the monotypic *Ostryopsis* of Eastern Asia, all the genera are found in North America, where the aggregate of the species is higher than it is either in Europe or Central Asia. *Betula*, *Alnus*, *Carpinus*, *Ostrya*, *Corylus*, *Quercus*, *Castanea*, and *Fagus* occur in the South-eastern States of North America; and *Betula*, *Alnus*, *Corylus*, *Quercus*, and *Castanopsis* in California. The absence of *Fagus* in California and Mexico is noteworthy, especially as the genus is common in the forests of Chili, commencing in about 33° S. lat. *Quercus* and *Alnus* extend to the Andes; the former numbering three South-American species and having its eastern limit at Pamplona and its southern limit about Popayan; the latter one variable species, which is very common in the mountains from South Mexico to Chiriqui, Colombia, Peru, and Bolivia. *Carpinus americanus* was added to the flora of Guatemala by Bernoulli's last collection; it ranges from Canada on the Atlantic side to Florida and Texas, but has not yet appeared in any Mexican collection. All the genera of the Cupuliferæ except *Ostryopsis* and *Castanopsis* are European. Oaks (*Quercus*) constitute such a prominent feature in the mountain vegetation of Mexico and Central America that a separate paragraph is devoted to the discussion of their distribution.

The Oak Vegetation.

DeCandolle's monograph of the genus *Quercus*[*] contains descriptions of 281 species; and subsequent discoveries, chiefly in the Malay Peninsula and Archipelago, have augmented the number to about 300, after deducting a number of badly defined ones. They are generally spread in the temperate regions of the northern hemisphere, except the mountains of tropical Africa and nearly all the West Indies, and they extend southward through the Malay Archipelago to New Guinea, where at least two or three species are known to exist. Three or four species occur in the mountains of Colombia the most southerly station being Popayan in about 2° 30′ N. lat. There *Q. humboldtii* grows up to an elevation of 9000 feet. One species, *Q. virens*, grows in Cuba, and is the only one hitherto found in the West Indies. This species is common in the South-eastern States of North America, as well as in Mexico and Guatemala, extending southward to Costa Rica. Our enumeration contains eighty-six proposed species; but there are probably not more than sixty distinct ones, and possibly fewer[†]. Fourteen are recorded from California, sixteen from the North-eastern States, and twenty from the South-eastern States; several of the eastern species ranging from Canada to Florida; but only three or four of the Mexican species, besides *Q. virens*, extend beyond Mexico, and these only into Texas, New Mexico, Arizona, and California.

Whether we estimate the number of species of Mexican and Central-American oaks at eighty-six or sixty-six the fact remains that they constitute one of the most important elements and one of the most conspicuous features in the vegetation of the subtropical and temperate regions of Mexico and Central America. Every traveller dilates on the magnificence and vast extent of the oak forests; and Liebmann, who made a special study of them, enters somewhat fully into their distribution, and from his memoir[‡] we extract the following particulars, not exactly in the author's words, because it was necessary to condense as much as possible. He describes an ascent from the eastern sea-coast.

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[*] A. DeCandolle, 'Prodromus,' xvi. 2, pp. 2–107 (1864).

[†] Wenzig, in a revision of the American species of *Quercus* (Jahrbuch des königlichen botanischen Gartens . . . . zu Berlin, iii. 1884), published since our enumeration, reduces the number of Mexican and Central-American forms to about sixty-five species.

[‡] Americas Egevegetation, 1851. Translation in Hooker's 'Kew Journal of Botany,' iv. 1852, p. 321, and v. p. 9.

Humboldt, with insufficient data before him, placed the lower limit of oaks on the eastern side of Mexico at 2400 feet; but subsequent explorations prove that they range, in certain districts at least, from the sea-coast up to an altitude of 12,000 feet. *Quercus oleoides* * descends to the very coast in the State of Vera Cruz, forming small groves on the savanas, rarely forests. It is a handsome though small tree, and is usually covered with showy epiphytical and parasitical plants belonging to the Orchideæ, Aroideæ, Bromeliaceæ, Piperaceæ, Loranthaceæ, &c. The country rises imperceptibly from the coast, and at 2000 to 3000 feet other species of oak appear, forming small open forests. They are trees of small dimensions, having small, rigid, usually woolly leaves. *Quercus petiolaris*, *Q. tomentosa*, and *Q. affinis* are characteristic of this belt. At an elevation of 3000 feet oak trees are larger and loftier and form dense forests composed of a considerably increased number of species. Here the mean temperature is 62°·5 F., and the rainfall great. The principal species of this region are:—*Q. jalapensis*, one of the largest of Mexican oaks; *Q. alamo*, a stupendous tree with large coriaceous leaves; *Q. polymorpha*, a small species of crooked growth; *Q. lanceolata*, with willow-like leaves, and the handsome *Q. ghiesbreghtii*. They are laden with epiphytical and parasitical plants of the orders named above and others. Beneath the shade of the oaks grow various species of *Chamædorea*, and on their roots the scarlet *Monotropa coccinea* and *Conopholis sylvatica*. A variety of woody climbers of the genera *Banisteria*, *Paullinia*, *Serjania*, *Smilax*, *Rubus*, and *Vitis* connect the stems and branches and render the forests impenetrable. On the outskirts of the forest an exceedingly elegant and slender bamboo (*Arundinaria acuminata*) abounds; its tough, flexible stems rise to a height of twenty-five feet and are no thicker than a goose-quill.

Above this rich region of plants the gently sloping plains cease, the country becomes mountainous, and at 4000 to 5000 feet palms disappear and are replaced by tree-ferns. The cooler atmosphere, abundant moisture, and broken country offer the most favourable conditions for the oak, and it is here that the species find their greatest concentration in Mexico. Dense forests of numerous species clothe the mountain-sides. In addition to those already named, there are many other species, some of them, like *Quercus galeottii* and *Q. insignis*, are remarkable for the very large size of their acorns. Although here as elsewhere in Mexico the oaks are evergreen, they are nearly leafless during a very short period of the year in consequence of the continued violent northerly winds. Many elegant epiphytes, at other seasons inconspicuous, come into flower at this period, and embellish the trees with bright colours. Among them are *Juanulloa parasitica*, *Columnea schiedeana*, various species of *Echeveria*, Orchideæ, and Bromeliaceæ. At elevations of 6000 to 7000 feet pines begin to mingle with the oaks; yet the latter still predominate and constitute the bulk of the forests. The prevailing species in this region are *Quercus lanceolata*, *Q. laurifolia*, and *Q. glabrata*, often forming only dense thickets interwoven with numerous Convolvulaceæ and climbing grasses. The hornbeam *, lime, willow, and cornel are met with in these forests associated with a host of noble trees of the Laurineæ. Above 7000 feet oaks gradually decrease, being replaced by pines; and at elevations of 8000 to 10,000 feet they are only found scattered among the pines. Among the species here are *Quercus spicata*, *Q. reticulata*, *Q. chrysophylla*, and *Q. pulchella.* Most of the epiphytes and parasites of the lower regions have disappeared, though some species of *Viscum* still abound. Mosses and lichens become plentiful, and *Usnea barbata* hangs in festoons from the branches, replacing *Tillandsia usneoides* of the warmer zones. But oak-vegetation does not entirely cease on the peak of Orizaba below an altitude of 12,000 feet.

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* Several of the specific names mentioned in these extracts stand as synonyms in our Enumeration.

During the last 350 years there has been an enormous destruction of the oak-forests, especially in the States of San Luis Potosi, Guanajuata, and Oaxaca, where the wood was largely used for smelting silver.

The oak-vegetation of the Northern States of the interior of Mexico is rich in species, but almost all the trees are low and stunted—often only shrubby, and not forming forests, but occurring in scattered groups on the steep mountain-flanks. They are found chiefly at elevations of 6000 to 8000 feet, often completely covered with *Tillandsia usneoides.*

As an example of the large number of species found in a small area on the arid mountains of the interior, Liebmann enumerates twenty-two observed by him in the silver-mine district of Real del Monte; and he adds that the same species inhabit all the mountains of the interior from Zacatecas to Oaxaca. In the eastern valleys of Oaxaca the oak descends to an elevation of a few thousand feet only. Among the species found are—*Q. salicifolia*, *Q. tomentosa*, *Q. petiolaris*, and *Q. skinneri*; the last also inhabits the western side of Guatemala. On the higher peaks of the Cordilleras of Oaxaca, as Sempoaltepec, Pelado, and Cumbre de Ocote, some species ascend to elevations of 10,000 to 11,000 feet, where they form stunted shrubs two or three feet high.

The western cordilleras of Mexico, like the eastern, have their oak-forests, but they are far from being so fine, in consequence of the dryness of the climate; and they have not been so fully explored.

In North-western Mexico Seemann collected thirteen species of *Quercus*; and he states † that the first evergreen oaks were met with at an elevation of 1500 feet above the sea-level (ascending from Mazatlan), but that the increase of the number of the species as well as that of individuals was rapid, and at about 3000 feet they were associated with some Coniferæ and a rich mountain flora

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* Perhaps the hop hornbeam (*Ostrya*) is intended here, for we have seen no specimens of *Carpinus* from Mexico, though the common North-American species has been recently discovered in Guatemala.

† Botany of the Voyage of the 'Herald,' p. 263.

In Southern Mexico, in the Isthmus of Tehuantepec, according to Barrosa [*], *Quercus virens* begins at about 100 metres above the level of the sea, and in the central part associated with a pine it covers large areas.

We have eighteen species of *Quercus* recorded from Guatemala, where, as in Mexico, oak-forests constitute one of the most important elements of the vegetation. Thus in the western mountains (Volcan de Fuego) the chief forest above the tropical zone consists of evergreen oaks succeeded by pines [†].

Although we have only one species of *Quercus* noted as Nicaraguan, there is ample evidence of the existence of oak-forests in various parts of Nicaragua [‡], and the genus is probably not less strongly represented than it is in Costa Rica, where some ten species are known to exist, nine of which are also natives of either Mexico or Guatemala, or both. Finally, Seemann collected three species on the Volcan de Chiriqui. Two of these have been described as species not found elsewhere, while the third has been identified with one also recorded from Guatemala. The region of oaks, alder, and *Agave americana* in Chiriqui is fixed by Moritz Wagner [§] at from 4200 feet to 8000 feet; and here as in Mexico the oaks are associated with palms (*Chamædorea*) up to an altitude of 7000 feet.

Much more might be said concerning the distribution of the oaks of Mexico and Central America, but it must suffice to repeat the important facts of their almost total absence from the West Indies, their great rarity in the Andes, where they do not extend southward to the equator, and the richness and abundance of endemic forms within our limits.

Lacistemaceæ.

Lacistema is a genus of shrubby and arboreous plants restricted to the New World, and so distinct in character that it cannot well be treated otherwise than as an independent natural order, the position of which in a linear arrangement is not easily settled. There are about sixteen species spread all over tropical America including the West Indies, but chiefly in Brazil and Guiana. Only one species (*L. myricoides*, Sw.) has been found in Mexico and Central America; this is spread throughout the West Indies, and covers nearly the whole area of the order in South America. Furthermore it is the only species known to grow in the West Indies.

The Coniferous Vegetation.

Five out of six of the tribes of Coniferæ adopted in Bentham and Hooker's 'Genera

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[*] "Apuntes sobre la Vegetacion del Istmo de Tehuantepec," Anales del Ministerio del Fomento de la República Mexicana, iii. (1880) pp. 309–330.

[†] O. Salvin, "Der Volcan de Fuego in Guatemala," Petermann's Geographische Mittheilungen, 1861, p. 395.

[‡] Pim and Seemann, 'Dottings in Panama and Nicaragua,' passim.

[§] Petermann's 'Geographische Mittheilungen,' 1863, p. 294. *Agave americana* should probably be *Furcræa gigantea.*

Plantarum' are represented in Mexico and Central America, the absent tribe being the Araucarieæ. *Podocarpus* itself is spread all over the West Indies, and in South America it ranges from Colombia to Brazil and Chili; and Œrsted records a narrow-leaved species as growing on the mountains of Costa Rica, but we have seen no specimens from within our limits. On the other hand, the distribution of the Araucarieæ is comparatively remote from our region, the nearest stations being in Brazil and Chili. Of the Cupressineæ there are three and five species respectively of the widely spread northern genera *Cupressus* and *Juniperus* in Mexico, and one of them has been collected in Guatemala. Of the small yet notable tribe Taxodieæ there is one celebrated Mexican species of the genus *Taxodium*, otherwise represented only in the south-eastern States of North America by a closely allied species (or variety) and by an imperfectly known species in Chili. Of the Taxeæ there is one Mexican species of the generally dispersed northern genus *Taxus*. Of the remaining tribe, Abietineæ, there are three genera, namely *Pinus*, *Abies*, and *Pseudotsuga*, and about twenty-one species in Mexico and Central America. The last-named genus is a monotype, ranging from Oregon to New Mexico, and reappearing in the mountains of Moran and Real del Monte; whether it exist in the intervening country is problematical. *Abies religiosa* is an endemic Mexican representative of its genus, which belts the northern hemisphere in temperate regions. Finally there is the genus *Pinus*, the most numerous in species of the order, and constituting a prominent feature in the vegetation of Mexico and some parts of Central America. Indeed the uppermost forests consist almost entirely of species of *Pinus*, and those next below largely of species of *Pinus* and *Quercus* intermixed. *Pinus* and *Quercus* have nearly the same wide range in the northern hemisphere; but *Pinus* is not known to extend so far south as New Guinea in the eastern hemisphere, and Nicaragua is apparently its southern limit in America. One species at least of *Pinus* is common in Cuba; one is found in San Domingo, and one in the Bahamas. Altogether the genus *Pinus*, as usually limited, comprises about seventy species, two thirds at least of which are American; and nowhere else are such broad expanses of pine-forests. There are twelve species of *Pinus* in the Atlantic States; fourteen in California and northward, and four or five in the intermediate regions. The forms of *Pinus* in Mexico are numerous, and the species difficult of delimitation, and many of them imperfectly known. There may be a score of species, either more or less; and three or four extend into north-western regions; two as far northward as Oregon and British Columbia.

The distribution of pines within Mexico and Central America presents some singular anomalies, independent apparently of climate; but until the species are better defined their full significance cannot be appreciated. As might be expected, their lower limits vary in different districts, but not always from explainable causes. Grisebach states * that no species has been found in Mexico below the level of 3000 feet. Humboldt records "*Pinus occidentalis*" (=*P. montezumæ*, Lamb.) as very common in the equinoctial parts of Mexico at altitudes of 580 to 2020 toises, or about 3500 to 12,000 feet; but it is apparently rare at the lower elevation. Galeotti collected one species in the cordillera of Oaxaca as low as 4000 feet, and two others at 5000 feet; and Liebmann states that pines begin to mingle with oaks on the eastern cordilleras of Vera Cruz at 6000 to 7000 feet. Against this, in the much lower latitude of Nicaragua, and, so far as is at present known, the southern limit of pines in America [*], Œrsted [†] fixes the pine-region on the Volcan el Viejo in about 12° 30′ N. lat. at 3000 to 4200 feet. What species this is we have not ascertained; but Seemann [‡] mentions passing through a forest of *Pinus tenuifolia* at Ocote, north-east of El Viejo, and probably at a lower altitude. In Cuba and the Isla de Piños, where pines are abundant, as observed by Humboldt [§], and also in British Honduras, they grow down to the sea-level, and this, be it remembered, within the tropics. Yet pines are absent from Jamaica, notwithstanding the considerable elevation of the Blue Mountains. Humboldt was of opinion that the Cuban pine was the same species so common in Mexico (here referred to *P. montezumæ*), where it ranges between 3000 and 12,000 feet; but this does not appear to be so. Nevertheless, as already mentioned, much remains to be done in the definition of the Mexican species. At all events the common pine of British Honduras, collected by Mr. D. Morris, is undistinguishable from *P. cubensis*, Griseb., which may or may not be the same as *P. occidentalis* of Swartz. It is estimated that about one-third of the area of British Honduras is composed of "Pine ridge" country, where *Pinus cubensis* is the principal tree, and which, according to Morris [||], is probably the most abundant tree in the colony. With regard to the upper limit of pines in Mexico that seems to vary as much in different localities as the lower. As already mentioned, Humboldt gives the vertical range of "*Pinus occidentalis*" at 3500 to 12,000 feet, the whole range of the genus. Linden and Galeotti, on the labels accompanying their specimens, record *P. montezumæ* and *P. patula* from 10,000 to 12,000 feet, on the Peak of Orizaba, and the latter from 4000 to 5000 feet on the cordilleras of Oaxaca. Liebmann collected *P. oocarpa* at Chinantla, Puebla, at an elevation of 7000 to 8000 feet; and Roezl *P. hartwegii* on Popocatepetl at an elevation of 13,000 to 14,000 feet [¶]. Liebmann, as cited elsewhere (p. 150), states that *P. montezumæ* reaches 13,600 feet on the eastern side of Orizaba, and even 14,000 feet on the western side, where it is dwarfed, but never either shrubby or prostrate. This considerably exceeds the altitude attained by the alder.

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* Vegetation der Erde, ii. p. 317.

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[*] Grisebach, 'Gesammelte Abhandlungen,' p. 260, records *Pinus occidentalis* from Costa Rica; but this was perhaps a slip of the pen; and Polakowsky (Peterm. Mittheil. 1877, p. 221) states, erroneously as we believe, that Œrsted found *Pinus occidentalis* and *Abies religiosa* at the southern end of the Lake of Nicaragua.

[†] Botanische Zeitung, 1848, p. 881.

[‡] Bedford Pim and Berthold Seemann, 'Dottings on the Roadside in Panama, Nicaragua, and Mosquito,' p. 55.

[§] Relation Historique, iii. p. 377.

[||] The Colony of British Honduras, p. 57.

[¶] Parlatore in DeCandolle's 'Prodomus,' xvi. 2, p. 400.

But it is at elevations of 6000 to 10,000 feet that the enormous pine-forests of Mexico chiefly exist*. For fuller details of the distribution of the Coniferæ the reader is referred to the writings of Beinling, Brown, and Hildebrand enumerated in our Bibliography.

Cycadaceæ.

The number of described genera and species of this order affords only a very inadequate idea of the prominent feature cycads form in the vegetation of the districts where they grow; and as they are not readily reduced to herbarium specimens the particulars usually accompanying such are to a great extent wanting for this order. Nine genera and about seventy-five species are known, many of them imperfectly, and they are thinly scattered over the tropics, South Africa, and Australia; and *Cycas revoluta* is a native of Japan. No species has been found in the dry regions of Chili. The genera of the Old World and America are all different, and the majority of the species are local; *Cycas circinalis* is, however, an exception, being widely spread in the tropics of the Old World, especially in littoral districts. Within our districts there are three genera, two of them endemic in Mexico, and one general in tropical America; and the number of species is twenty-one, whereof fifteen are endemic; three extend to South America, and three to the West Indies. Altogether sixteen species are recorded from Mexico, but several of them are doubtful, and more complete material is needed of almost all of them. *Stangeria* in South Africa and *Bowenia* in Eastern Australia are very remarkable monotypic genera of this order.

Orchideæ.

Orchids are generally diffused in all regions, and very nearly reach the extreme altitudinal and latitudinal limits of phanerogamic plants; yet they are either absent or exceedingly rare in oceanic islands†. With the exception of the terrestrial genera of north temperate regions, and a few others, the genera are mostly restricted to the eastern or western hemisphere, and largely to single continents. This holds good both for tropical genera and the terrestrial genera of the southern hemisphere, where totally different genera inhabit the three great areas. The same remarks are applicable to species in a greater degree, a large proportion of which are comparatively local. The greatest concentration of orchids is in America, from South Mexico to Colombia.

Mexico and Central America are pre-eminently rich, and, although Nicaragua and Costa Rica have been very little explored, and many of the small-flowered Mexican ones doubtless overlooked, yet orchids have probably been quite as fully collected as any class of plants; therefore future investigations are likely to lower rather than raise the proportion of orchids to the rest of the flora. Orchideæ in Mexico, so far as our present knowledge goes, stands third in the list of orders according to number of species; but what is more remarkable they comprise upwards of 400 species more than the Gramineæ, the next order below them; hence it may be confidently assumed that they will maintain this position, and possibly even take the second place where the Leguminosæ now stand. In Mexico and Central America, taken together, orchids form 8 per cent. of the species of phanerogamic plants, and 37 per cent. of the monocotyledons. Taking South Mexico alone, the most thoroughly explored part of our area, they constitute about 30 per cent. of the monocotyledons. The percentage of orchids in monocotyledons for the whole world is about 28; that is reckoning the species of the former at 5000, which is certainly none too high. Assuming the number of orchideous genera to be 350, we have 30 per cent. of them in Mexico and Central America, and about 18·8 per cent. of all the species. Out of 105 genera only fourteen are actually restricted to our limits. Three extend into western North America; six into eastern; sixty into the West Indies, and eighty-two into South America; but of the remainder only fifteen extend beyond America. Ten of these, which are nearly all of terrestrial habit, are of wide distribution; two (*Epidendrum* and *Govenia*) are represented in the Galapagos, two (*Bletia* and *Arethusa*) in China and Japan, and *Physurus* in tropical Asia. Of the widely diffused genera, the terrestrial genus *Spiranthes*, limited to the section Euspiranthes, specially deserves mention as having the widest range of any orchid type. It is found in America from the Arctic regions to Chili, including the West Indies; and the only orchid in the Bermudas is a *Spiranthes*. In the Old World the genus is generally spread, except in Tropical and South Africa; and *S. australis* has the widest area and is the commonest of all species of orchids, as it extends from Afghanistan and China to Australia and New Zealand. *Spiranthes romanzoviana*, a common North-American species, is elsewhere only found in county Cork*, Ireland. A specimen in the British Museum, purporting to have been collected by Pavon in Mexico, has been identified as this species by Mr. Ridley.

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* C. B. Heller, Reisen in Mexico, pp. 171, 182, &c.

† See Voyage of the 'Challenger' Expedition, Botany, i. Introd. p. 27.

Coming to the species of orchids within our limits, we find that 800 out of 938, or 85 per cent., are endemic; figures unapproached by any other large order, except the Compositæ, which is 5 per cent. lower. An examination of the distribution table (p. 195) further shows that the endemic element is proportionately much stronger in Mexico and Guatemala than it is in the southern area. Looking at the distribution within Mexico, it is very striking and surprising how rapidly the numbers decrease northward, or rather, it would be more correct to say, how suddenly orchids cease almost altogether. From what we know of the routes of the various collectors, whose plants are not localized in herbaria, we may safely add the "Uncertain" column to South Mexico, which gives 500 species for this region. Turning to the North-Mexican column there is a total of only twelve species. This extremely low number seemed to demand a second examination of the data; and the result of this examination was its probable reduction to nine. The species recorded from North Mexico are—*Meiracyllium gemma*, *Microstylis ophioglossoides*, *M.* sp., *Hexalectris aphylla*, *Govenia andrieuxii*, *Odontoglossum madrense*, *Oncidium sphacelatum*, *Spiranthes madrense*, *S. polyantha*, *Pogonia* sp., *Habenaria leucostachys*, and an unnamed species of *Habenaria*. The *Oncidium* was included through a misprint in the Enumeration, and the *Odontoglossum* and *Meiracyllium* were put under North Mexico, because they were recorded from the Sierra Madre; but in all probability they are natives of South Mexico. This being so, there would remain only terrestrial species belonging to genera extending into the United States, except *Govenia*. Indeed America, north of Mexico, is extremely poor in Orchids; the whole country supporting only about two thirds of the number found in Europe. Twenty-two are recorded from California, and, as a further illustration of the range of the northern terrestrial genera, it may be added that, with the exception of *Calypso borealis*, a North-European orchid, they all belong to British genera. Fifty-six species inhabit the Northern United States, and sixty-two (including upwards of a dozen tropical species in the extreme south of Florida) the Southern States; many of the species being common to both. The following northern species enter Mexico*:—*Epipactis americana*, *Habenaria repens*, *H. leucostachys*, *Hexalectris aphylla*, *Microstylis ophioglossoides*, *Ponthieva glandulosa*, and *Spiranthes romanzoviana*. The monotypic *Hexalectris* is the only genus of these restricted to North America and Mexico. Of the non-endemic species of Mexican and Central-American orchids 108 are known to extend into some part of South America, and 75 into the West Indies. In an order containing so large a proportion of endemic and local species among those with which we have to deal, it may be interesting to give a list of the few species having a wide area in America. To these may be added the northern *Spiranthes romanzoviana*, which ranges northward through California to Kamtschatka, and eastward through Canada to New York; and also, as mentioned above, inhabits, or did inhabit, South-western Ireland.

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* Or perhaps we should state was found, for there are reports of its recent destruction through the land being ploughed.

In South Africa Orchideæ appear to occupy the fourth place in number of species, and in Australia the seventh place; in both regions terrestrial species largely predominate. Available data for comparison with the floras of Colombia, Brazil, and other parts of South America are wanting; but Grisebach gives the order the second place in the West-Indian flora, and as constituting 6–7 per cent. Of the flowering-plants of Trinidad known to him, 11 per cent. were orchids; but the orchid element had been specially investigated.

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* After the completion of our distribution-tables we discovered that the additional Orchids in the Supplement to Chapman's 'Flora of the Southern United States' had been omitted from our calculations. The additional species are:—*Epidendrum cochleatum*, *E. nocturnum*, *Polystachya luteola*, *Vanilla planifolia*, and *Crytopodium punctatum*; all of them from the extreme south of Florida. This is a nominal addition of five species and three genera to the numbers of Mexican species and genera extending into eastern North America; but, as explained elsewhere, the tropical forms found in South Florida have no special significance in relation to the distribution of Mexican plants, being in reality a part of the West-Indian region.

Mexican Orchids having a wide range in other parts of America.

	Mexico.	Central America.	West Indies.	Columbia.	Peru.	Guiana.	Brazil.	North America.
Bletia nodosa	1	1	1	1	....	1		
Cleistes rosea	....	1	1	1	1	1		
Cyrtopodium punctatum	1	....	1	1	....	1	1	
Dichæa echinocarpa	1	1	1	1	....	1	1	
—— trichocarpa	....	1	1	....	....	1	1	
Dinema paleacea	1	1	1	1	1	1		
Epidendrum ciliare	1	1	1	1	....	1		
—— cochleatum	1	1	1	1	....	....	....	1
—— difforme	1	1	1	....	....	....	1	
—— floribundum	1	1	....	1	....	1		
—— fragrans	1	1	1	1	....	1	1	
—— fuscatum	1	1	1	1	....	1	1	1
—— nocturnum	1	1	1	1	1	1	1	
—— ramosum	1	1	1	....	....	1	1	
Ionopsis utricularioides	1	1	1	1	1	1	1	
Isochilus linearis	1	1	1	1	....	1	1	
Lepanthes ophioglossoides	1	....	1	....	....	1	1	
Liparis elliptica	1	1	1	1	....	1		
Lockhartia elegans	1	....	1	1	....	....	1	
Maxillaria camaridium	....	1	1	1	....	1		
Microstylis umbellulata	1	1	1	1	1	1		
Oncidium ampliatum	1	1	1	1				
—— cebolleta	1	1	1	1	1	1	1	
—— pusillum	1	1	1	1	1	1	1	
Pleurothallis ruscifolia	....	1	1	1	1	1		
Polystachya luteola	....	1	1	1	....	1	1	1
Ponthieva glandulosa	1	1	1	1	....	....	....	1
Rodriguezia secunda	....	1	1	1	....	1	1	
Stelis ophioglossoides	1	....	1	....	....	1	1	
Stenorrhynchus orchioides	1	1	1	....	....	1	1	
Totals 30	24	26	29	24	8	25	18	4*

A few particulars respecting the orchids, from Guatemala to Panama, and their altitudinal distribution in Mexico:—Our Enumeration records 238 species from the former country; 71 from Nicaragua, 198 from Costa Rica, and 104 from Panama. All these figures, except perhaps those for Guatemala, must be far below the numbers actually existing in these countries, especially as regards the inconspicuous species. South Mexico, more especially the States of Vera Cruz, Mexico, Puebla, and Oaxaca, is only surpassed in orchid vegetation, if at all, by some parts of Colombia, and the most comprehensive view of the altitudinal succession of the numerous genera and species, from the sea-coast to their highest limits, is sketched by A. Richard and H. Galeotti†; but, as we reproduce the substance of that in another place, it is sufficient to refer to it here. They enumerate, however, some half a dozen species of *Habenaria*, *Spiranthes*, and *Microstylis* which inhabit the peak of Orizaba at elevations of 11,500 to 12,800 feet.

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* Three out of four of these are tropical species, only found in South Florida.

† 'Comptes rendus des Séances de l'Académie des Sciences,' xviii. 1844, pp. 497–513.

The proportions of the tribal representation of orchids present no very remarkable features. All the tribes are there, and the Epidendreæ and Vandeæ in nearly equal numbers. Of the former there are thirty-seven genera and 440 species, 182 of which are *Epidendrum* itself, and there are fifty-six of *Pleurothallis*. The Vandeæ are represented by fifty genera and 370 species, *Oncidium* and *Odontoglossum* being characteristic, and numbering respectively seventy-two and forty-two species. The Neottieæ comprise 100 species, belonging to fifteen genera, eight of which extend beyond America, six being widely diffused. *Spiranthes* (including *Stenorrhynchus*) is the largest genus, having thirty-four species. *Habenaria* is the only genus of the Ophrydeæ, the bulk of which are north temperate and South African. Finally the Cypripedieæ are represented by one species of the widely-spread genus *Cypripedium*, and three of the singular *Selenipedium*.

Bromeliaceæ.

About 350 species, belonging to twenty-seven genera, of this distinct and wholly American natural order of plants were known to Bentham and Hooker; and upwards of a fourth of them are found within our limits. Judging from recent collections from Brazil and other parts of tropical America, the number of species, at least, will yet be largely augmented. Many of the Bromeliaceæ are not easily dried, and collectors seem to have neglected the less conspicuous species. They are essentially tropical plants, and mostly epiphytal in habit, yet a considerable number ascend to temperate regions in the mountains of Central and South America, and a few extend far beyond the tropics in both hemispheres; two or three inhabiting the island of Juan Fernandez. Ten species of *Tillandsia* inhabit Florida, and one of these, *T. usneoides*, finds its northern limit in Virginia, and is very generally spread in humid districts southward through Mexico and the West Indies to Chili and Uruguay. It also reaches the Rio Pecos in Texas, the western limit of the order in North America. In appearance it resembles a lichen or moss, its flowers being small and inconspicuous, and trees are often completely clothed with it, even high up in the mountains. Another species, *T. recurvata*, inhabits Florida, Texas, Mexico, the West Indies, extending southward to Buenos Ayres; and several other Mexican species are also found in the West Indies and South America; still the majority of the Bromeliaceæ are rather restricted in their range, and many are apparently quite local. It is noteworthy that the widely-dispersed species have, for the greater part, comparatively inconspicuous flowers. On the other hand, the Bromeliaceæ generally are unsurpassed in the vegetable kingdom for brilliancy of colouring, and the striking contrasts of colour exhibited by their flowers and also often by their leaves. *Tillandsia usneoides* is perhaps the humblest member of the order, which presents its highest development in tree-like puyas of the cordilleras of Chili.

The Agave and Yucca type.

Plants of this type, belonging to the orders Amaryllideæ and Liliaceæ, are so numerous and so specially characteristic of Mexico and the countries immediately to the north as to demand separate consideration. The genera are *Beschorneria*, *Agave*, and *Furcræa* belonging to the former order, and *Yucca*, *Nolina*, and *Dasylirion* belonging to the latter order. These genera are all peculiar to America, and a careful examination of their present distribution seems to indicate that the outlying species have spread from the Texano-Mexican region, taken in a wide sense, that is, including New Mexico and Arizona. Of course it does not necessarily follow that because the species of a genus are now most numerous in a certain region the genus originated there; but the majority of the outlying species of the genera under consideration are also natives of the Texano-Mexican region, thus strongly favouring the presumption that such was the case in this instance. Moreover, these plants, though belonging to distinct natural orders, have the same general habit of growth, and long, rigid, fleshy or dry leaves, crowded on usually very short stems, and relatively large inflorescences. They differ greatly in stature, from two or three feet to sixty or occasionally taller. The trunk of *Furcræa gigantea* attains a height of three or four feet, while the flower-scape is twenty-five to thirty feet. The tallest, however, is *Furcræa longæva*, which forms an unbranched trunk forty to fifty feet high, surmounted by a large dense crown of leaves; and its inflorescence is thirty to forty feet high, making altogether a height of nearly 100 feet. These and some of the larger species of *Agave* are next to palms in size among monocotyledonous plants. The species of *Furcræa* and many of *Agave*, although attaining a great age, flower only once (are monocarpic) and then die. In this they resemble some of the palms; the talipot (*Corypha umbraculifera*) and the wine-palm (*Caryota urens*) for examples. On the authority of Karwinski *, who discovered the gigantic *Furcræa longæva* in the mountains of Oaxaca among stunted oaks and arbutuses at altitudes of 9000 to 10,000 feet, this species requires a very long period before it can put forth flowers—about 400 years, according to the traditions of the natives. This is probably a greatly exaggerated period; yet several instances are on record of plants of this class having been cultivated in Europe for eighty to a hundred years before producing flowers. But the flowering of these perennial monocarpic plants is a most interesting and phenomenal event. It has been observed that all the individuals of certain monocarpic species of palm and bamboo flower the same season throughout very extensive districts. How far this is influenced by recurring stimulating climatal conditions, or how far it is an inherent constitutional action, limited in its fulfilment, is uncertain; but, as bearing directly on the subject, it may be mentioned that plants of *Chusquea abietifolia*, imported from Jamaica, flowered at Kew the same season as the plants of this grass generally in the island itself.

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* Nova Acta Nat. Cur. xvi. (1833) p. 665.

The genera *Yucca*, *Dasylirion*, and *Nolina* are polycarpic; the second has apparently strictly diœcious flowers, while the last is polygamously diœcious, both being in this respect quite exceptional in the order Liliaceæ.

With regard to the number of species, particularly of the genus *Agave*, and their local distribution, our information is exceedingly meagre. From the large number of forms now cultivated in this country, it is evident that the genus is very diversified, presenting distinct groups of species, the majority of which, however, are only known from their foliage. But as mere numbers do not affect the main issues, this circumstance is of little consequence from a geographical stand-point. With regard to the distribution within our limits, we have no knowledge of any species of *Yucca*, *Nolina*, *Dasylirion*, or *Beschorneria* south of Guatemala, and the records of these genera, as well as of *Furcrœa* and *Agave*, south of Mexico, are extremely few. It seems improbable that the two last genera do not exist in Nicaragua and Costa Rica, yet we have no evidence of their existence in these countries. Possibly we may have overlooked allusions to them in books of travel, or failed to make a note of them in consequence of not appreciating their importance at the time. Seemann * enumerates *Furcrœa tuberosa* from the slopes of the Volcan de Chiriqui, and *F. gigantea* from the Island of Cacagual, Darien. The former was collected by Mandon in open situations, at 2600 metres, near Sorata, Bolivia, and we have seen specimens of it from Venezuela and New Grenada; but it is commonly cultivated for its fibre and readily colonizes, hence it is difficult to determine where it is really indigenous. Martius† mentions that it has been cultivated and widely spread ever since America was discovered, and that it is impossible to fix its origin; while of *Agave americana* he says, "nullibi eam vidi efferatam." *Furcrœa cubensis*, he suggests, may also be an introduced plant in Brazil. Wagner‡ states that *Agave americana* is a characteristic plant of the oak and alder region of Chiriqui, from 4200 to 8000 feet; but this he may have confused with the *Furcrœa* mentioned by Seemann. Plants of this type in the West Indies are—*Agave americana*, general; *A. sobolifera*, *A. spicata*, and *Furcrœa cubensis*, common; *F. gigantea*, Antigua and French Islands; and *Yucca aloifolia* in Jamaica and Antigua§. Both *Agave americana* and *Furcrœa gigantea* have established themselves in the Mauritius, and the latter also in Rodriguez and Madagascar. These, then, are practically all the southward and eastward extensions, though there may be one or two more species. In the Atlantic States of North America there are four species of *Yucca*, one of *Nolina* and *Agave virginica*, mostly inhabiting sandy districts near the sea.

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* Botany of the Voyage of the 'Herald,' p. 216.

† Flora Brasiliensis, iii. 1, p. 188.

‡ Petermann's Geographische Mittheilungen, 1863, p. 294.

§ Grisebach, 'Flora of the British West-Indian Islands,' and 'Catalogus Plantarum Cubensium,' and Egger's 'Flora of St. Croix and the Virgin Islands.'

Three species of *Agave* and two of *Yucca* are recorded from Arizona; and three each of *Agave*, *Nolina*, and *Yucca* from California. About half of these species are common to Mexico. In addition, there are at least half a dozen other Mexican species extending to Texas and New Mexico, and perhaps as many as a dozen. One endemic species of *Agave* and two Californian species of *Nolina* have been found in Lower California. As to the northern limits of this type of plants in Central and western North America, we only know that a few species reach Southern Colorado and Southern Utah. Enough has been written, however, to prove that Mexico, and probably Northern Mexico, is the centre of them, and that they thin out rapidly in every direction as we recede from this centre. Plants of similar habit and aspect are found in the numerous species of *Aloe* in South Africa, in *Cordyline* of Australasia, and *Dracæna* of the Mascarene Islands, &c.*

Liliaceæ.

Under the "*Agave* and *Yucca* type," a portion of this order has already been discussed, but the remaining genera demand a few words. These are thirteen in number, and seven of them do not extend beyond America, and they number collectively eighty-three species. It may here be observed that twelve out of a total of seventeen genera have a north-western extension, though the number of species is only eleven. Thirty of the eighty-three species belong to *Smilax*; there are three Mexican monotypic, endemic genera, and a fourth is common to New Mexico and Arizona. Noteworthy is the remarkably distinct and showy western genus *Calochortus*, of about thirty species, six of which are subalpine in North and South Mexico, and endemic, and twenty-one inhabit California, while a few are found in New Mexico and Arizona. The genus ranges northward to British Colombia. Two genera, *Zygadenus* and *Nothoscordum*, are common to Eastern Asia and America.

Palmæ.

In consequence of the great difficulties attending the preparation and preservation of specimens adequate for description and classification, palms are less known in detail, perhaps, than any other class of plants; indeed, we are assured by Sir Joseph Hooker that he has hardly sufficient material of any one of the numerous palms of British India to draw up a satisfactory description. Fortunately the successful cultivation of palms in large houses has to some extent, small though it be, supplied the deficiencies of the herbarium; but the discoveries of the last ten years go to prove that the palm-world is far from having been exhausted, even in the imperfect manner indicated. Palms, with comparatively few exceptions, cover small areas, and are often exceedingly local, alike in insular and continental regions. The cocoa-nut palm (*Cocos nucifera*) is the only species having a very wide range; but how much of that is due to human agency, and how much to other agencies, such as oceanic currents, is not easy to determine. Of the American genera of palms only two, excluding *Cocos*, are represented elsewhere; these are *Elæis* and *Raphia*, both otherwise only African. Drude[*], however, treats *Raphia vinifera* as an African type, introduced by some means in America, though ranging on the sea-shore from the mouth of the Amazon to Nicaragua; and he further suggests that the African *Elæis*, though specifically distinct from the American, is, in like manner, of American origin, of very remote introduction in Africa, may be "thousands of years." He bases his argument on the fact that all the Cocoineæ, with this exception, and the now widely-spread *Cocos nucifera*, are exclusively American[†]. Of course, admitting an unlimited period to elapse since migration or conveyance took place, the origin of many outliers might be explained in this way. But to return to palms generally; it is not only species and genera that are comparatively restricted in their range; the same law applies more largely to the tribes than is the case in most large orders. Drude[‡] shows that of ten natural tribes of palms only three are common to America and the Old World, and only two of them belt the world.

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* Since the above was in type Mr. S. Watson has sent us a description of *Prochnyanthes*, a proposed new genus of the Agaveæ, inhabiting Jalisco.

Palms are spread over about half the surface of the land, and are essentially plants of the tropical zone, where they are generally spread, rapidly thinning-out both in species and individuals outside of the tropics. At present about 1100 species of palm are known, and these have been divided into 140 genera—numbers low in relation to the prominent and proportional position they occupy in tropical scenery. Nearly a score of orders are more numerous in species, but not one forms so large a part of the vegetation. Some palms grow intermixed with other trees, whilst others grow in groves of countless individuals; and they certainly constitute the most striking feature in tropical vegetation. America is, perhaps, the richest country in palms, which culminate in numbers in the Amazon region; but they are also very numerous in the Malay Archipelago. The highest latitudinal limits of palms in the Old World are about 44° in New Zealand (where there is one species), 35° in Japan, and 43° in Europe; in each case represented by solitary outliers. In South America one endemic species inhabits Chili up to about 38° latitude, and one Juan Fernandez in 34°. In western North America the limit is about 34°, and in eastern about 36°. Nearly all these outlying palms belong to monotypic genera peculiar to each region.

The enumeration of Mexican and Central-American palms (iii. pp. 400–415) contains 118 species, belonging to twenty-four genera; but so little is known of the palms of the purely tropical parts that further investigations may considerably augment these numbers. Indeed, several palms not included in our enumeration are mentioned in the sketches of the vegetation of Honduras, Guatemala, and other countries, which we have compiled from various sources.

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[*] "Geographische Verbreitung der Palmen," Petermann's Mittheilungen, 1878, p. 103.

[†] *Raphia vinifera*, Beauv., var. *tædigera*, syn. *R. nicaraguensis*, Œrst., was accidentally omitted from our distribution table, and *Cocos nucifera* was intentionally excluded, like many other cultivated plants. Nevertheless, the latter is almost certainly indigenous in America (and most likely in Central America), to which country all the other species of *Cocos* are peculiar.

[‡] Botanische Zeitung, 1876, p. 801.

Six of the genera are endemic, and seventeen of the remaining eighteen are restricted to America. The distribution of the only one extending beyond America has already been discussed. Of the species upwards of 95 per cent. are endemic, and the others do not extend beyond America. Nearly two thirds of them belong to the genera *Chamædorea*, *Geonoma*, and *Bactris*. The first of these three genera is specially characteristic of the Mexican and Central-American highlands, extending southward in the Andes to Peru, but not reaching the West Indies; and upwards of forty species have been described from within our limits. They are mostly small, slender, elegant palms with reed-like flexible stems and small leaves; and some of them are perfect miniature members of their order, not exceeding a foot in height. Perhaps the most diminutive of all is *Chamædorea tenella*, figured in the 'Botanical Magazine' (t. 6584), concerning which Sir Joseph Hooker wrote, "Our male specimen is nine inches high, and the female seven, yet it ripened fruit well." A mean temperature of about 62°·5 F., abundance of moisture, and shady situations are the conditions under which they flourish best; and they chiefly inhabit the oak-forests at elevations of 2000 to 4500 feet, varying of course according to latitude and aspect. Thus, on the authority of Liebmann's labels, *Chamædorea cataractarum* grows near the cataracts of Chinantla at 1200 to 1500 feet; *C. humilis* in various localities at 1500 to 3000 feet; and *C. pacaya*, in the barrancas of the Volcan de Chiriqui up to 7000 feet*. It is not certain what the palms are that Liebmann had in view in the statement that species of *Corypha* and *Chamærops* reach an altitude of 8000 feet in the interior (see p. 147). But this is not an improbable height, inasmuch as *Oreodoxa frigida* inhabits the Andes at 2000 to 2800 metres, while *Euterpe andicola*, the most alpine of all palms, reaches nearly 3000 metres. *Geonoma* and *Bactris* are genera of about 100 species each, chiefly inhabiting the tropical regions; thirty-seven of the former and fifty-four of the latter are Brazilian. Only a few species reach Mexico, the bulk being from Costa Rica. Conspicuous among the palms of the sea-shore and tropical zone of Central America and Mexico are species of *Oreodoxa*, *Socratea*, *Thrinax*, *Acrocomia*, *Elæis*, *Cocos*, and *Attalea*. Heller† mentions that he saw trees of *Oreodoxa regia* at Cordova, which were 150 feet high; but these were probably planted, as they are in many other places. Morris‡ regards it as an introduced palm in British Honduras, where, on the same authority, *O. oleracea* is abundant in the lowlands and on the banks of rivers.

The endemic genera *Malortiea*, *Reinhardtia*, *Asterogyne*, *Calypterogyne*, *Pholidostachys*, and *Welfia* are all elegant palms, mostly of the slender habit and small size of *Chamædorea*.

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* Wagner in Petermann's Mittheilungen, 1863, p. 294.

† Reisen in Mexico, p. 109.

‡ The Colony of British Honduras, p. 68.

A few words concerning the palms in other parts of America:—The south-eastern States of North America are inhabited by three species of *Sabal*, by the monotypic *Rhapidophyllum*; and comparatively recently three species of *Thrinax* and *Oreodoxa regia* have been found in South Florida. The northern limit of the palmettos (*Sabal*) is North Carolina, and an apparently endemic species of *Sabal* is abundant in the Bermudas. The palms of western North America are *Washingtonia filifera*, a monotype, in Southern California and Western Arizona, and two species of the genus *Erythea*, also peculiar to the region—one inhabiting Guadalupe Island and the other the Tantillas Mountains, Lower California. About forty palms are known to grow in the West Indies*—the genera *Thrinax*, *Bactris*, and *Sabal* being especially numerous. A not inconsiderable number of them are peculiar to Trinidad. Thus, one each of *Mauritia*, *Hyospathe*, *Jessenia*, *Geonoma*, *Manicaria*, and *Astrocaryum*, and four of *Bactris*, proving a connection with Guiana which does not extend to the other islands. The palms of Brazil number 251 species, belonging to thirty-five genera, only two of which are actually endemic. Drude, the monographer of the order, divides Martius's region Naiades, or what, in this work, has been designated the Amazon region, into four districts, namely: a littoral district, in which there are 79 species; a central with 99, a north-western with 110, and south-western with 32 species. In the whole region there are probably not less than 200 species; and thirty-three out of the thirty-five genera occur in this region. Of course these figures mean much more in an order like the Palmæ than in such an order as the Compositæ for example; and the number of species of palms within our limits is no guide to the relative proportion in the composition of the vegetation on account of the smallness of most of the Mexican species. The characteristic Mexican *Chamædorea* is represented in Brazil by two species.

Cyclanthaceæ.

Four genera and about thirty-five species of this peculiarly American order are recorded; but, like Palms, they have been little collected, and much, doubtless, remains to be done before we shall get an approximate idea of the numbers actually existing. They appear to be generally spread in eastern tropical America and the West Indies; and two or three are found in Venezuela, Guiana, and Peru. The number within the southern part of our area is probably greater than that enumerated by us, including those species contained in the Supplement. In floral structure the Cyclanthaceæ are very near the Aroideæ and the Old-World Pandaneæ, from which, however, they are readily distinguished by their habit and foliage.

Aroideæ.

The Aroideæ are generally diffused, except in the coldest regions, attaining their maximum development, however, in the tropics, and by far most numerous in tropical

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* Drude, Peterm. Mitth. 1878, p. 99.

Asia; yet, in consequence of their size and the abundance of individuals, perhaps more conspicuous and equally prevalent in tropical America. There are about 100 genera and 900 species; and of these fifteen and 115 respectively are known to inhabit Mexico and Central America. But these numbers are probably considerably below those actually existing; that for species especially, as we record only ten from Nicaragua and fourteen from Panama. *Porphyrospatha*, a genus of two described species, is restricted to Costa Rica, and the only one endemic within our limits. On the other hand, ninety-nine of the species have not been recorded from elsewhere. *Philodendron* and *Anthurium*, both exclusively American, the former numbering about 120 species, the latter 160, are the most conspicuous and pervading genera throughout tropical America. Many of the species are lofty climbers, reaching the tops of the tallest trees. Other large forms are the species of *Xanthosoma* and *Monstera*; but these are all surpassed in size of leaf and inflorescence by the Nicaraguan *Dracontium gigas* (syn. *Godwinia gigas*), which has a spathe two feet long, though this, again, is small in comparison with the Sumatran *Amorphophallus titanum*, which has leaves twenty-five feet, and spadices six feet long.

Gramineæ.

Reference has already been made (vol. iii. p. 475) to Fournier's 'Monograph of the Mexican Grasses,' in which a much narrower view of the limits of genera and species is taken than in this work. So great indeed is the difference, that his totals of genera and species for Mexico alone considerably exceed ours for Mexico and Central America together. He recognizes 123 genera, sixteen of them being endemic, and 643 species, 371 of which he estimated to be endemic. It is unnecessary to repeat our reasons for not accepting the greater part of his proposed new species. Had we included them in our calculations they would, from our standpoint, have greatly exaggerated the endemic element, as will be perceived from the following numbers:—genera ninety-nine, endemic six; species 520, endemic 265. There is no doubt, however, that these numbers will be very considerably augmented by future investigations in the southern part of our area, as, for instance, in Costa Rica, whence we have only nine species.

The grasses of Œrsted's Costa Rica collection have not been elaborated; and it appears to have been the practice to distribute the duplicates as the plants were published. From the Table, p. 199, it will be seen that we have worked out the distribution of the two great "series" of grasses—the Panicaceæ, distinguished by the spikelet being articulated with the pedicel below the outer glumes, and the Poaceæ, in which the articulation is above the outer glumes; but the results do not demand any special remarks in this place. In addition to the six endemic genera, twenty-six others are restricted to America, and no fewer than fifty-nine are of wide distribution. Of the non-endemic species 214 are restricted to America, which, added to the endemic, leaves a residue of forty-one that extend beyond America. Adding the Mexican genera and species which are not localized to the South Mexican, we have a total of ninety-one genera, represented by 454 species; and the numbers for North Mexico are fifty-seven and 184 respectively. The most considerable American extension of these genera and species is into South America, where no fewer than eighty-five of the genera are represented by the same or other species; and 185 of the Mexican and Central-American species actually extend into South America. In point of numbers the West Indies come next. The northward extensions are much lower than might have been expected for this order of plants; this is specially emphasized in the species. Fifty of the Mexican genera are found in western North America, as defined for the purposes of this work, and sixty-two of the species enter the same region, though very many of them do not range beyond Texas, New Mexico, and Arizona. But, what is more surprising, only quite a small number of grasses are common to California and Mexico. It is true that the Monocotyledonous orders generally have more species common to Mexico and eastern North America than to Mexico and western; yet it is not so markedly exhibited by any other large order as by the grasses. Fournier, indeed, could enumerate only three grasses common to California and Mexico, namely, *Panicum fimbriatum*, *Tripsacum dactyloides*, and *Sporobolus virginicus* *; but we are able to add to the list †. We find the following species common to the two countries:—*Cenchrus tribuloides*, *Phalaris arundinacea*, *Stipa eminens*, *S. viridula*, *Sporobolus cryptandrus*, *Epicampes rigens*, *Agrostis scabra*, *A. varians*, *A. verticillata*, *Bouteloua aristoides*, *B. oligostachya*, *B. polystachys*, *Monanthochloe littoralis*, *Bromus ciliatus*, *Hordeum jubatum*, and *Elymus sitanion*.

Forty-eight genera and sixty-four species are common to Mexico and eastern North America; but figures alone do not adequately express the degree of extension. It will be perceived that the numbers are nearly the same as the western; but a much larger proportion of the species are common and widely spread, and, one might say, characteristic of the whole eastern side of the northern continent. Fournier directs attention to this fact in the work cited. According to his material, thirty-three of the Mexican grasses were common to Texas, and sixty-five to the Eastern States.

It is also noteworthy that the only member of the Andropogoneæ hitherto found in California is *Ischœnum leersioides*, Munro, a native of Southern China, colonized near San Francisco; yet they are not uncommon in the Atlantic States.

The endemic genera are *Euchlœna*, *Schaffnera*, *Bauchea*, *Jouvea*, *Opizia*, and *Calamochloa*. *Euchlœna* is a remarkable and interesting grass, most nearly allied to the maize (*Zea*), having the sexes similarly separated, and very long exserted styles. Several of the endemic grasses of the Texano-Mexican region are remarkable for the complete separation of the sexes, either monœciously or diœciously ‡. To this category belong *Jouvea*, *Opizia*, *Buchloe*, and *Scleropogon* (see Plate 101), the last-named inhabiting Mexico and New Mexico and recurring in Mendoza.

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* Mexicanarum Plantarum Enumeratio, Glumaceæ, Introd. p. xv.

† Watson's Botany of California.

‡ Fournier, "Sur les Graminées mexicaines à sexes separés," Bull. Soc. Bot. Belg. xv. 1876, pp. 459–476.

Among the remaining exclusively American genera within our limits we may mention the broad-leaved *Pharus* (Paniceæ), *Tripsacum*, next *Euchlæna* in Maydeæ, *Luziola* in Oryzeæ, *Hilaria* in Zoysieæ, *Bouteloua* in Aveneæ, *Monanthochloe*, *Dissanthelium*, *Orthoclada*, *Zeugites*, and *Uniola* in Festuceæ, and *Chusquea* and *Guadua* in Bambusæ; nearly all of them very distinct genera.

With regard to the extra-American distribution, fifty-nine of the genera and thirty-six of the species are widely spread. Four genera, namely, *Anthephora*, *Olyra*, *Trachypogon*, and *Ctenium*, are only represented in Africa; *Olyra* by one species, probably the common American *O. latifolia*. *Distichlis thalassica* is common on the coast of South-eastern Australia, but not recorded from elsewhere in the Old World. In conclusion, the interrupted distribution of *Phleum alpinum* merits notice. This grass inhabits the Peak of Orizaba at 10,000 to 12,000 feet; the Andes of Chili to Fuegia; the alpine and arctic regions of North America, Europe, and Asia.

Filices and other Vascular Cryptogams.

The distribution of the genera and species of sporiferous plants is generally much wider than that of seminiferous plants, being limited apparently by climatal conditions only; and where the conditions are favourable, as in some regions of Mexico and Guatemala, in New Zealand, and other parts of the world, large numbers are found in comparatively small areas. A considerable degree of humidity is, of course, one of the indispensable conditions for the majority of ferns, but, as will presently be shown, certain genera affect dry regions. We allude now more particularly to the ferns. Taking the genera as circumscribed in Hooker and Baker's 'Synopsis Filicum,' there are, including a few recent new ones, about eighty, forty-eight of which are represented in Mexico and Central America, and forty-one of them in South Mexico alone, where the number of species known is 380. On the same basis, the total number of species of Ferns now known is, as Mr. J. G. Baker informs us, approximately 3000; and our total is 545; so that South Mexico and Guatemala together shelter one sixth of the species of the whole world.

As previously explained (vol. iii. p. 589), Fournier monographed the Mexican ferns. Here, as in the grasses, he founded a large number of species which are not recognized as such in this work. Thus, for Mexico alone he defined 605 species against our 545 for Mexico and Central America together. However, with the exception of species, we obtain very similar results. Out of his 605, 178 were peculiar to Mexico; and of the 427 common to Mexico and other regions, 230 were found in the Andes, 139 in the West Indies, 59 in Venezuela and Guiana, and 117 in Brazil, most of them as far south as Rio Janeiro.

Of the forty-eight genera within our boundaries only one, the monotypic *Llavea*, is endemic, and only three others, namely, *Hypoderris*, *Dictyoxiphium*, and *Danæa*, are peculiar to America. Besides the Nicaraguan *Hypoderris*, there is one other species endemic in Trinidad; *Dictyoxiphium* is a monotype ranging from Panama to New Granada and Venezuela; and *Danæa* is a distinctly characterized genus of about a dozen species, restricted to tropical America.

Proceeding to the extra-American distribution of the genera, no fewer than forty-two are widely diffused; the curious and well-marked *Anemia* is represented in South Africa by one species, *Hemitelia* in Australia by two or three species, and one of the South-American species is also found in South Africa.

Of the 545 species within our boundaries, 159 are endemic, and 293 others are restricted to America; in other words, nine elevenths of them do not extend beyond America. Ninety-three species have a wider range—seventy-four being widely diffused, ten African, one Asiatic, four Polynesian, three Galapagoan, and one has only been found in Tristan da Cunha and America.

A few more words respecting the distribution of ferns in Mexico and Central America. A glance at the Table, p. 200, is sufficient to convince us that the fern flora of the southern countries is still very imperfectly known, especially that of Costa Rica; though since our Tables were drawn up the number of species has been increased to 134 (see page 115 of this volume); and we may confidently assert that the better-explored Guatemala and South Mexico will yet yield a good many more novelties. The bulk of the 254 Guatemalan ferns in the Kew Herbarium were collected by Messrs. Godman and Salvin in a comparatively restricted area. Fournier states * that the ferns of both slopes, Atlantic and Pacific, of the Mexican cordilleras are the same, with very few exceptions; indeed, he knew of only three from the Pacific side which were not found on the Atlantic; but then he had very few species from North Mexico, and not a single one from the western State of Sonora. Recent explorations have considerably augmented the number of North-Mexican ferns. Our enumeration contains 100, and Pringle and Palmer's subsequent collection would probably add four or five more. Considering the great falling off, in fact almost total absence, of orchids and other epiphytal plants in North Mexico, this number of ferns is at first a little surprising, because we are apt to associate them with moisture and shade. On examining the composition of this fern-flora this surprise will disappear, for it will be found that the genera *Notholæna*, *Cheilanthes*, and *Pellæa*, genera specially characteristic of dry regions, largely predominate. The prevalence of these genera in South Africa, Australia, &c., and their general distribution, is in similar regions. After these genera hard-leaved species of *Polypodium* and *Asplenium* are the most numerous; the five genera named furnishing six tenths of the species. For purposes of comparison, and to show that this peculiar flora extends northward into Arizona and the adjoining territories, it may be added that, out of seventy-one ferns enumerated by Engelmann † as inhabiting the United States territories west of 105°

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* Fournier, "Sur la distribution géographique des Fougères du Mexique," Comptes Rendus, lxviii. 1869, pp. 1040–1042.

† In Rothrock's 'Botany of Arizona &c.'

and south of 40°, thirty-six belong to the genera *Cheilanthes*, *Pellæa*, and *Notholæna*. Further observations on this subject will be found at p. 224. Incidentally, but not as having any particular bearing on the distribution of the North-Mexican species, it may be stated that the fern-flora of America north of Mexico comprises about 150 species, or less than a fourth more than the small area of New Zealand.

Coming to the rest of the Vascular Cryptogams, Mr. J. G. Baker, who has recently published a synopsis, divides them into four orders, eleven genera, and about 550 species. All the orders, seven of the genera, and sixty-two of the species are represented in Mexico and Central America conjointly. The absent genera are *Pilularia* and *Isoëtes*, subaquatics which may be expected to occur; and the remarkably distinct Australasian *Phylloglossum* and *Tmesipteris* from Australasia and Polynesia, also recorded (erroneously?) from California. The distribution of these Cryptogams within our limits calls for no special remarks, except that they are comparatively rare in North Mexico, numerous in South Mexico, and imperfectly investigated in the southern countries. Their general distribution is given in some detail in vol. iii. under the several orders. Some of the species (*Lycopodium clavatum*, for example, as pointed out by Baker in his little book on Geographical Botany) belong to "meiotherms" which are practically universal in temperate regions, including the mountains of the tropics.

A SPECIMEN OF THE MOUNTAIN FLORA OF SOUTH MEXICO AND CENTRAL AMERICA*.

			feet.
Thalictrum (W.) densiflorum (E.)	Moran,	Mexico.	8,000
—— hernandezii (E.)	Toluca,	„	8,200
Ranunculus (W.) geoides (E.)	Orizaba,	„	9,000 to 12,000
—— ornithorrhynchus (N.)	Toluca,	„	8,200 to 9,000
—— petiolaris (E.)	Santa Rosa,	„	8,400
—— peruvianus (A.)	Orizaba,	„	12,000 to 12,500
—— sibbaldioides (A.)	Toluca,	„	12,000
Aquilegia (W.), sp. (E.)	Oaxaca,	„	8,000
Delphinium (W.) latisepalum (E.)	Oaxaca,	„	8,000 to 8,500
Berberis (W.) paniculata (E.)	Irazu,	Costa Rica.	8,000 to 9,000
Nasturtium (W.) arabiforme (E.)	Oaxaca,	Mexico.	8,000 to 9,000
—— impatiens (E.)	Orizaba,	„	11,000 to 12,000
—— orizabæ (E.)	Orizaba,	„	10,000 to 12,000
Draba (W.) myosotidioides (E.)	Orizaba,	„	12,000 to 13,000

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* The letters placed after the genera and species have reference to their distribution:—E. signifies endemic in South Mexico and Central America; N. extending in America north of Mexico; S. extending into South America or the West Indies, or both; A. peculiarly Andine; N. & S. extending into both North and South America; W. of wider range than America.

		feet.
Draba popocatepetlensis (E.)	Popocatepetl, Mexico.	12,000
—— tolucensis (E.)	Toluca, ,,	8,000 to 14,000
Sisymbrium (W.) canescens (A.)	Orizaba, ,,	12,000
—— galeottianum (E.)	Orizaba, ,,	8,000 to 11,000
Erysimum (W.) macradenium (E.)	Toluca, ,,	12,000 to 13,000
	Real del Monte, ,,	8,000
Viola (W.) ciliata (E.)	Orizaba, ,,	10,000
—— humilis (E.)	Real del Monte, ,,	8,550
—— umbraticola (E.)	Real del Monte, ,,	8,550
Polygala (W.) boykinii (N.)	Cerro de Quinzeo, Mexico.	8,500
Monnina (S.) xalapensis (E.)	Fuego, Guatemala.	8,300
Cerastium (W.) andinum (E.)	Toluca, Mexico.	13,000
—— orithales (E.)	Orizaba, ,,	12,000
—— vulcanicum (E.)	Orizaba, ,,	10,000 to 12,000
Stellaria (W.) nemorum (W.)	Toluca, ,,	8,000
Arenaria (W.) alsinoides (N. & S.)	Orizaba, ,,	10,000 to 12,000
—— bryoides (E.)	Orizaba, ,,	12,450
	Toluca, ,,	14,000 to 15,000
	Popocatepetl, Mexico.	11,500
	Fuego, Guatemala.	13,000
—— decussata (E.)	Toluca, Mexico.	8,200
—— lycopodioides (E.)	Moran, ,,	8,000
—— scopulorum (A.)	Toluca, ,,	8,800
Colobanthus (W.*) quitensis (A.)	Orizaba, ,,	12,500
Calandrinia (W.) megarhiza (E.)	Fuego, Guatemala.	11,000 to 12,000
Hypericum (W.) moranense (E.)	Moran, Mexico.	8,000
—— pauciflorum (E.)	Santa Rosa, ,,	9,000
—— pratense (E.)	Toluca, ,,	8,200
Clusia (S.), sp. (E.)	Fuego, Guatemala.	8,300
Saurauja (W.) oreophila (E.)	Fuego, ,,	10,500
Modiola (N. & S.) caroliniana (N. & S.)	Moran, Mexico.	8,040
Cheirostemon (E.) platanoides (E.)	Toluca, ,,	8,250
	Fuego, Guatemala.	8,000 to 10,000
	Los Encuentros, Mexico.	7,000 to 8,000
Geranium (W.) carolinianum (N.)	Oaxaca, Mexico.	9,000 to 11,000
—— hernandezii (E.)	Oaxaca, ,,	7,000 to 9,000
—— potentillæfolium (E.)	Toluca, ,,	9,000 to 10,000
—— seemanni (E.)	Toluca, ,,	8,800
Oxalis (W.) albicans (A.)	Moran, ,,	8,040 to 8,880
—— divergens (E.)	Oaxaca, ,,	7,000 to 8,000
Ceanothus (N.) azureus (E.)	Popocatepetl, Mexico.	8,000
—— buxifolius (E.)	Real del Monte, ,,	8,550
Crotalaria (W.) ovalis (N. & S.)	Fuego, Guatemala.	8,300
Lupinus (W.) aschenbornii (E.)	Toluca, Mexico.	8,800
	Irazu, Costa Rica.	9,000 to 11,000

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* Antarctic and Australasian.

		feet.
Lupinus bimaculatus (E.)	Toluca, Mexico.	12,000
—— campestris (E.)	Oaxaca, „	7,000 to 8,000
—— clarkei (E.)	Irazu, Costa Rica.	8,000 to 9,000
—— elegans (E.)	Real del Monte, Mexico.	8,000
	Orizaba, „	9,000 to 10,000
—— glabellus (E.)	Orizaba, „	9,000 to 10,000
—— mexicanus (E.)	Popocatepetl, „	10,000 to 11,000
—— montanus (E.)	Toluca, „	9,000 to 10,200
	Oaxaca, „	8,000 to 9,500
—— pilosissimus (E.)	Oaxaca, „	8,000 to 9,500
—— vaginatus (E.)	Orizaba, „	9,000 to 12,000
	Popocatepetl, „	12,000
	Toluca, „	11,500
	Fuego, Guatemala.	11,000 to 13,000
Trifolium (W.) amabile (A.)	Toluca, Mexico.	8,280
	Fuego, Guatemala.	8,300
—— involucratum (N.)	Regla, Mexico.	6,000 to 8,000
Eysenhardtia (N.), sp. (E.)	Valladolid, Mexico.	7,000 to 8,000
Indigofera (W.) densiflora (E.)	Oaxaca, „	8,500
—— excelsa (E.)	Oaxaca, „	7,000 to 8,500
Brongniartia (E.) vicioides (E.)	San Felipe, „	7,000 to 8,000
Astragalus (W.) guatemalensis (E.)	Fuego, Guatemala.	10,500
—— helleri (E.)	Orizaba, Mexico.	9,000
—— strigulosus (E.)	Oaxaca, „	8,000
——, sp. (E.)	Cerro Ventoso, Mexico.	7,000 to 8,000
Amicia (E.) zygomeris (E.)	Oaxaca, „	5,500 to 8,000
Desmodium (W.) amplifolium (E.)	Oaxaca, „	7,000 to 8,000
—— nitidum (E.)	Yavezia, „	7,000 to 8,000
Vicia (W.) pulchella (E.)	Oaxaca, „	8,000
Cologania (A.) intermedia (E.)	Real del Monte, „	8,550
Phaseolus (W.) formosus (E.)	Toluca, „	8,280
	Oaxaca & Real del Monte, Mex.	6,500 to 8,000
—— obvallatus (E.)	Oaxaca, Mexico.	7,000 to 8,000
——, sp. (E.)	Fuego, Guatemala.	8,300
Mimosa (W.) adenantheroides (E.)	Oaxaca, Mexico.	7,000 to 8,000
Calliandra (W.) cumingii (A.)	Oaxaca, „	6,000 to 8,000
Prunus (W.) capuli (A.)	Oaxaca, „	6,000 to 8,000
Spiræa (W.) discolor (N.)	Orizaba, „	10,000 to 12,000
	Guatemala.	10,000 to 11,500
Rubus (W.) occidentalis (N.)	Fuego, Guatemala.	10,500
—— trilobus (E.)	Orizaba, Mexico.	10,000
	Misteca Alta, Mexico.	7,500 to 9,000
Potentilla (W.) candicans (E.)	Tianguillo, „	9,000
—— ranunculoides (E.)	Cerro de las Cruces, Mexico.	10,000
	Orizaba, „	12,000
—— richardii (E.)	Orizaba, „	12,500
Alchemilla (W.) orbiculata (A.)	Orizaba, „	12,000

		feet.
Alchemilla sibbaldiæfolia (A.)	Orizaba, Mexico.	9,000 to 12,000
	Tianguillo, ,,	9,000
	Agua, Guatemala.	10,000
—— tripartita (A.)	Orizaba, Mexico.	14,000 to 15,300
Acæna (W.) agrimonioides (E.)	Tianguillo, ,,	9,000
—— elongata (E.)	Orizaba, ,,	10,000 to 12,000
Heuchera (N.) orizabensis (E.)	Orizaba, ,,	11,000 to 12,500
Ribes (W.) jurullense (E.)	Popocatepetl, ,,	10,000 to 12,000
	Toluca, ,,	10,000 to 12,000
	Orizaba, ,,	10,000 to 12,000
—— microphyllum (E.)	El Guarda ,,	8,400
Sedum (W.) guatemalense (E.)	Fuego, Guatemala.	8,000
—— napiferum (E.)	Toluca, Mexico.	8,000
Myrtus (W.) œrstedii (E.)	Irazu, Costa Rica.	9,000
Eugenia (W.) irazuensis (E.)	Irazu, ,,	9,000
Pleroma (S.) longifolium (S.)	Oaxaca, Mexico.	6,000 to 8,000
—— schiedeanum (E.)	Oaxaca, ,,	6,500 to 8,000
Monochætum (S.) alpestre (E.)	Oaxaca, ,,	8,000
	Pelado, ,,	10,000
	Vaqueria del Jacal, Mexico.	10,000
——, sp. (E.)	Fuego, Guatemala.	8,300
Miconia (S.) erythrantha (E.)	Oaxaca, Mexico.	7,500 to 8,000
——, sp. (E.)	Fuego, Guatemala.	8,500
Cuphea (N. & S.) æquipetala (E.)	Fuego, ,,	8,300
—— cyanea (E.)	Oaxaca, Mexico.	6,000 to 8,500
—— hookeriana (E.)	Toluca, ,,	8,800
Lythrum (W.) gracile (E.)	Orizaba, ,,	7,500 to 8,000
Œnothera (N. & S.*) rosea (N. & S.)	Real del Monte, Mexico.	8,000
——, sp. (E.)	Orizaba, ,,	10,000
——, sp. (E.)	Fuego, Guatemala.	8,300
Fuchsia (S.†) arborescens (E.)	Fuego, ,,	8,300
—— bacillaris (E.)	Agua, ,,	8,000
	Fuego, ,,	8,300
—— cordifolia (E.)	Guatemala.	10,000
—— intermedia (E.)	Totontepec, Mexico.	10,000
—— microphylla (E.)	Popocatepetl, ,,	10,000
—— mixta (E.)	Orizaba, ,,	9,800 to 10,000
—— parviflora (E.)	Fuego, Guatemala.	8,300
Lopezia (E.) galeottii (E.)	Mexico.	5,000 to 8,000
—— hirsuta (E.)	Orizaba, Mexico.	10,000
—— macrophylla (E.)	Mexico.	5,000 to 8,000
—— mexicana (E.)	Toluca, Mexico.	8,800
Gaura (N.) tripetala (N.)	Toluca, ,,	8,200
Cyclanthera (N. & S.) eremocarpa (E.)	Toluca, ,,	8,800
Microsechium (E.) guatemalense (E.)	Fuego, Guatemala.	8,300

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* Also in Tasmania.

† And in New Zealand.

		feet.
Microsechium ruderale (E.)	Orizaba, Mexico.	9,000 to 10,000
	Toluca, „	8,800
Begonia (W.) anodæfolia (E.)	Oaxaca, „	6,000 to 8,000
Mamillaria (N. & S.) cornifera (E.)	Actopan, „	7,000 to 8,000
	Ismiquilpan, Mexico.	7,000 to 8,000
	Mineral del Monte, Mexico.	7,000 to 8,000
	Pachuca, „	7,000 to 8,000
	Zimapan, „	7,000 to 8,000
—— gladiata (E.)	Ismiquilpan, „	9,000 to 10,000
	Pachuca, „	9,000 to 10,000
—— glochidiata (E.)	San Pedro Nolasco, „	7,000 to 8,000
—— magnimamma (E.)	Apam, „	7,000 to 8,000
	San Mateo &c. „	7,000 to 8,000
—— supertexta (E.)	San José del Oro, „	13,000
—— uberiformis (E.)	Pachuca, „	7,000 to 8,000
—— uncinata (E.)	Cerro Ventoso, „	8,500
—— vetula (E.)	San José del Oro, „	13,000
	La Encarnacion, „	11,000
—— zephyranthoides (E.)	Oaxaca, „	7,000 to 8,000
Echinocactus (N. & S.) macrodiscus (E.)	Cumbre, „	10,000
Eryngium (W.) bonplandii (E.)	Guanajuato, Mexico.	8,580
—— carlinæ (E.)	Toluca, Mexico.	8,800
—— cymosum (E.)	Orizaba, „	8,000 to 10,000
—— longirameum (E.)	Oaxaca, „	7,000 to 8,000
—— proteæflorum (E.)	Orizaba, „	12,000
—— scaposum (E.)	Oaxaca, „	9,000
Sanicula (W.) mexicana (E.)	Fuego, Guatemala.	8,300
Tauschia (A.) coulteri (E.)	Oaxaca, Mexico.	7,000 to 9,000
—— nudicaulis (A.)	Toluca, „	10,500
Arracacia (A.) acuminata (A.)	Fuego, Guatemala.	8,300
—— decumbens (E.)	Oaxaca, Mexico.	7,000 to 8,000
—— tolucensis (E.)	Toluca, „	8,280
—— sp. (E.)	Orizaba, „	9,500
—— sp. (E.)	Orizaba, „	9,500
Smyrnium (W.) ægopodioides (E.)	Moran, „	8,050
Osmorrhiza (W.) brevistylis (W.)	Oaxaca, „	9,000
Ottoa œnanthoides (A.)	Orizaba, „	11,000
	Fuego, Guatemala.	13,000
Ligusticum (W.) dubium (E.)	Real del Monte, Mexico.	8,580
Peucedanum (W.) tolucense (E.)	Toluca, „	8,250
	Campanaria, „	9,500
	Orizaba, „	12,500
Oreopanax (A.) costaricense (E.)	Irazu, Costa Rica.	9,000
—— œrstedianum (E.)	Irazu, „	8,000 to 9,000
	Cartago, Mexico.	8,000 to 9,000
Viburnum (W.) acutifolium (E.)	Oaxaca, „	7,000 to 9,000
—— costaricanum (E.)	Irazu, Costa Rica.	9,000

		feet.
Viburnum microphyllum (E.)	Cuesta de S. Pedro Alto, Mex.	8,000
—— rhombifolium (E.)	Orizaba, Mexico.	9,000 to 9,750
—— stellato-tomentosum (E.)	Irazu, Costa Rica.	8,000 to 9,000
—— stellatum (E.)	Orizaba, Mexico.	8,000
	Irazu, Costa Rica.	9,000
Symphoricarpus (N.) microphyllus (E.)	Moran, Mexico.	7,800 to 8,500
	Popocatepetl, Mexico.	7,800 to 8,500
Abelia (W.) floribunda (E.)	Orizaba, ,,	10,000
		9,750
—— speciosa (E.)	Cerro de San Felipe, Mexico.	7,500 to 9,000
Lonicera (W.) gibbosa (E.)	Real del Monte ,,	8,600
Ravnia (E.) triflora (E.)	Candelaria, Costa Rica.	7,000 to 8,000
Psychotria (W.) bracteolata (E.)	Capulalpan, Mexico.	7,000 to 8,000
Crusea (E.), sp. (E.)	Oaxaca, ,,	7,000 to 9,000
Spermacoce (W.) lævigata (E.)	Toluca, ,,	8,000
Galium (W.) canescens (A.)	Real del Monte, Mexico.	8,000
—— fuscum (E.)	Cerro de Juquila, ,,	7,000 to 8,500
—— geminiflorum (E.)	Orizaba, ,,	9,500 to 10,000
—— obstipum (E.)	Yavezia, ,,	7,000 to 8,000
Didymæa (E.) mexicana (E.)	Orizaba, ,,	10,000
Valeriana (W.) affinis (E.)	Cerro de San Felipe, Mexico.	8,000 to 9,000
—— barbaræfolia (E.)	Real del Monte, ,,	7,500 to 8,500
	Moran, ,,	7,500 to 8,500
—— ramosissima (E.)	Cerro Ventoso, ,,	8,000
—— vaginata (E.)	Real del Monte, ,,	8,000 to 9,000
Ageratum (W.) adscendens (E.)	Orizaba, ,,	10,000 to 11,500
—— arbutifolium (E.)	Cofre de Perote, ,,	10,200
	Popocatepetl, ,,	11,000
	Orizaba, ,,	9,000 to 12,500
Stevia (S.) angustifolia (E.)	Sta. Rosa, ,,	7,207 to 8,000
—— clinopodia (E.)	Oaxaca, ,,	8,000
—— monardæfolia (E.)	Orizaba, ,,	8,000 to 12,000
—— nepetæfolia (E.)	Lake Tezcuco, ,,	9,000
—— podocephala (E.)	Oaxaca, ,,	8,000 to 9,000
—— subpubescens (E.)	Oaxaca, ,,	7,000 to 8,000
Eupatorium (W.) adenochætum (E.)	Orizaba, ,,	8,000 to 10,000
—— adenophorum (E.)	Carpio, ,,	8,200
—— argutum (E.)	Chapultepec, ,,	8,200
—— bellidifolium (E.)	Oaxaca, ,,	7,000 to 8,000
—— grandidentatum (E.)	Orizaba, ,,	10,000
—— ianthinum (E.)	Agua, Guatemala.	8,000
—— ixiocladon (E.)	Irazu, Costa Rica.	9,000
—— orizabæ (E.)	Orizaba, Mexico.	10,000 to 11,000
	Real del Monte, Mexico.	8,000
—— rhomboideum (E.)	Toluca, ,,	9,000
—— semialatum (E.)	Cartago, Costa Rica.	9,000

		feet.
Eupatorium semialatum (E.)	Irazu, Costa Rica.	9,000
—— subcordatum (E.)	Irazu, ,,	8,000
—— vulcanicum (E.)	Irazu, ,,	9,000
Brickellia (N. & S.) secundiflora (E.)	Toluca, Mexico.	9,000
Grindelia (N. & S.) inuloides (N.)	Morelia, ,,	8,000
Haplopappus (N. & S.) stoloniferus (E.)	Orizaba, ,,	8,000 to 12,000
	Agua, Guatemala.	12,300
	Fuego, ,,	13,000
Aster (W.) moranensis (E.)	Cerro Ventoso, Mexico.	8,650
	Moran, ,,	8,650
Erigeron (W.) scaposus (E.)	Oaxaca, ,,	7,000 to 8,000
	Orizaba, ,,	9,500
Conyza (W.) sophiæfolia (E.)	Moran, ,,	7,000 to 8,000
Baccharis (N. & S.) conferta (E.)	Real del Monte, ,,	8,000
—— heterophylla (E.)	Misteca Alta, ,,	7,000 to 9,000
—— multiflora (E.)	Tianguillo, ,,	9,000
	Toluca, ,,	9,000
—— polygalæfolia (A.)	Moran, ,,	7,800 to 9,600
—— thesioides (E.)	Santa Rosa, ,,	8,000
Chionolæna (S.) lavandulacea (E.)	Orizaba, ,,	12,500 to 15,000
	Irazu, Costa Rica.	11,000
Gnaphalium rhodanthum (E.)	Oaxaca, Mexico.	9,500
—— roseum (E.)	Cartago, Costa Rica.	11,000
	Irazu, ,,	11,000
—— schraderi (E.)	Fuego, Guatemala.	10,000 to 11,000
—— sp. (E.)	Orizaba, Mexico.	11,000
Desmanthodium (E.) ovatum (E.)	Oaxaca, ,,	7,000 to 8,000
Melampodium (N. & S.) montanum (E.)	Oaxaca, ,,	7,000 to 9,000
Jægeria (S.) hirta (S.)	Fuego, Guatemala.	8,300
Sabazia (S.) sarmentosa (E.)	Orizaba, Mexico.	9,000 to 11,000
	Oaxaca, ,,	8,000
Oyedæa (S.) acuminata (E.)	Irazu, Costa Rica.	9,000
Helianthus (N. & S.) cornifolius (E.)	Santa Rosa, Mexico.	8,700
—— micranthus (E.)	Santa Rosa, ,,	8,700
Perymenium (A.) cervantesii (E.)	Toluca, ,,	8,000
Verbesina (N. & S.) œrstediana (E.)	Irazu, Costa Rica.	8,000 to 9,500
Cosmos (A.) diversifolius (A.)	Oaxaca, Mexico.	8,000
—— scabiosoides (E.)	Oaxaca, ,,	8,000
Bahia (N. & S.) anthemoides (E.)	Toluca, ,,	8,300
Microspermum (E.) debile (E.)	Oaxaca, ,,	8,000
Tagetes (N. & S.) angustifolia (E.)	Toluca, ,,	8,500
—— micrantha (E.)	Fuego, Guatemala.	8,300
Cotula (W.) pygmæa (A.)	Mexico.	8,000
Achillea (W.) millefolium (W.)	Orizaba, Mexico.	10,000
Senecio (W.) amplifolius (E.)	Oaxaca, ,,	9,000
—— argutus (E.)	Cofre de Perote, Mexico.	9,500
—— barba-johannis (E.)	Fuego, Guatemala.	11,000

		feet.
Senecio chrysactis (E.)	Orizaba, Mexico.	12,000 to 13,000
—— cinerarioides (E.)	Moran, ,,	8,000
—— cirsioides (E.)	Cofre de Perote, Mexico.	9,600
	Orizaba, ,,	14,000
—— doratophyllus (E.)	Fuego, Guatemala.	8,300
—— eximius (E.)	Fuego, ,,	11,000
—— farfarus (E.)	Real del Monte, Mexico.	8,600
—— galecttii (E.)	Popocatepetl, ,,	11,500
—— gerberæfolius (E.)	Orizaba, ,,	10,000 to 15,000
—— helodes (E.)	Orizaba, ,,	11,500
—— multidentatus (E.)	Orizaba, ,,	9,000 to 12,500
—— multivenius (E.)	Irazu, Costa Rica.	8,000
—— napeæfolius (E.)	Oaxaca, Mexico.	9,000
—— œrstedianus (E.)	Irazu, Costa Rica.	9,500
—— orizabensis (E.)	Orizaba, Mexico.	10,000 to 12,500
—— procumbens (E.)	Orizaba, ,,	12,000 to 15,000
	Toluca, ,,	10,000 to 11,000
—— salignus (E.)	Moran, ,,	8,000
—— sinuatus (E.)	Guanajuato, Mexico.	8,500
	Santa Rosa, ,,	8,500
—— vulneraria (E.)	Pinahuistepec, ,,	9,000
Cnicus (W.) nivalis (E.)	Toluca, ,,	11,400
—— subcoriaceus (E.)	Fuego, Guatemala.	8,300
	Irazu, Costa Rica.	8,000 to 9,000
Perezia (N. & S.) reticulata (E.)	Oaxaca, Mexico.	7,000 to 8,000
Hieracium (W.) anthurum (E.)	Oaxaca, ,,	12,000
—— crepidispermum (E.)	Cerro de las Cruces, Mexico.	8,500
—— lagopus (E.)	Irazu, Costa Rica.	9,500
—— mexicanum (E.)	Popocatepetl, Mexico.	10,000
—— niveopappum (E.)	Orizaba, ,,	13,000
—— præmorsiforme (E.)	San Angel, ,,	8,000 to 8,500
	Cerro de las Cruces, Mexico.	8,000 to 8,500
—— thyrsoideum (E.)	Orizaba, ,,	12,000
Centropogon (A.) affinis (E.)	Oaxaca, ,,	8,000
Lobelia (W.) hartwegi (E.)	Oaxaca, ,,	8,000
—— laxiflora (E.)	Fuego, Guatemala.	10,500
—— nana (E.)	Real del Monte, Mexico.	8,000
	Moran, ,,	8,000
	Orizaba, ,,	11,000 to 12,500
—— orizabæ (E.)	Orizaba, ,,	9,000 to 10,000
Heterotoma (E.) lobelioides (E.)	San Antonio, ,,	8,000
Vaccinium (W.) confertum (E.)	Moran, ,,	8,400
	Fuego, Guatemala.	12,000
—— discolor (E.)	Oaxaca, Mexico.	7,500 to 9,500
—— geminiflorum (E.)	Orizaba, ,,	12,000 to 13,000
	Oaxaca, ,,	9,000 to 10,000
	Omitlan, ,,	8,400

		feet.
Arbutus (N.*) floribunda (E.)	Oaxaca, Mexico.	7,500 to 8,500
—— macrophylla (E.)	Oaxaca, ,,	8,000
—— spinulosa (E.)	Mechoacan, ,,	7,000 to 8,000
Arctostaphylos (W.) ledifolia (E.)	Oaxaca, ,,	7,000 to 8,500
—— pungens (N.)	Moran, ,,	7,800 to 8,400
	Villalpando, Mexico.	7,800 to 8,400
	Orizaba, ,,	12,000 to 12,500
Pernettya (S.†) buxifolia (E.)	Real del Monte, Mexico.	8,500
—— pilosa (E.)	Orizaba, ,,	9,000 to 12,000
	Oaxaca, ,,	9,000 to 10,000
	Fuego, Guatemala.	12,000
Gaultheria (W.) odorata (E.)	Fuego, ,,	12,000
Pyrola (W.) angustifolia (E.)	Oaxaca, Mexico.	9,000
	Orizaba, ,,	6,000 to 9,500
—— sartorii (E.)	Orizaba, ,,	9,000 to 10,000
—— secunda (E.)	Orizaba, ,,	8,000 to 10,000
Chimaphila (W.) umbellata (N.)	Orizaba, ,,	6,000 to 10,000
Clethra (W.) mexicana (E.)	Oaxaca, ,,	8,000
Myrsine (W.) myricoides (S.)	Cartago, Costa Rica.	6,800 to 8,000
—— penduliflora (E.)	Oaxaca, Mexico.	7,000 to 8,000
—— serrata (E.)	Reventado, Costa Rica.	8,000 to 9,000
Ardisia (W.) glanduloso-marginata (E.)	Irazu, ,,	8,000 to 9,000
—— irazuensis (E.)	Irazu, ,,	9,000
—— lævis (E.)	Irazu, ,,	8,000 to 9,000
—— nigro-punctata (E.)	Irazu, ,,	8,000 to 9,000
Philibertia (N. & S.) cynanchoides (N.)	Fuego, Guatemala.	8,000
Asclepias (W.) melantha (E.)	Oaxaca, Mexico.	8,000 to 9,000
Buddleia (W.) abbreviata (E.)	Pachuca, ,,	8,000
—— alpina (E.)	Irazu, Costa Rica.	10,000
—— humboldtiana (N.)	Santa Rosa, Mexico.	8,000
	Oaxaca, ,,	8,500
—— intermedia (E.)	Santa Rosa, ,,	8,000
—— lanceolata (E.)	Orizaba, ,,	10,000
	Fuego, Guatemala.	11,000
—— microphylla (E.)	Morelia, Mexico.	8,500
Erythræa (W.) pauciflora (E.)	Orizaba, ,,	8,000 to 9,000
Gentiana (W.) cæspitosa (E.)	Orizaba, ,,	8,000 to 9,000
—— ovalis (E.)	Orizaba, ,,	8,000 to 9,000
Halenia (W.) alata (E.)	Orizaba, ,,	9,000 to 10,000
—— decumbens (E.)	Oaxaca, ,,	8,000 to 9,000
—— gracilis (E.)	Fuego, Guatemala.	12,000
—— longicornu (E.)	Oaxaca, Mexico.	8,500 to 9,500
—— multiflora (E.)	Irazu, Costa Rica.	10,000
—— nudicaulis (E.)	Orizaba, Mexico.	9,000 to 12,000
—— nutans (E.)	Orizaba, ,,	9,000 to 10,000

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* Also in Europe.

† Also in Australasia.

		feet.
Halenia paucifolia (E.)	Orizaba, Mexico.	9,000 to 12,000
Polemonium (W.) grandiflorum (E.)	Orizaba, „	9,000 to 12,000
Phacelia (N. & S.) pimpinelloides (E.)	Popocatepetl, Mexico.	10,000
	Orizaba, „	12,500
Nama (S.) hirsutum (E.)	Oaxaca, „	7,000 to 9,000
—— latifolium (E.)	Oaxaca, „	8,000
	Fuego, Guatemala.	8,300
Echinospermum (W.) mexicanum (E.)	Orizaba, Mexico.	10,000
Amsinckia (N. & S.) mexicana (E.)	Mechoacan, „	8,000
Macromeria (A.) discolor (E.)	Oaxaca, „	8,000 to 9,000
—— longiflora (E.)	Morelia, „	8,000
Onosmodium (N.) strigosum (E.)	Morelia, „	8,000
Lithospermum (W.) distichum (E.)	Orizaba, „	11,000 to 12,000
—— spathulatum (E.)	Oaxaca, „	9,000
—— strictum (E.)	Toluca, „	9,500
Ipomœa (W.) simulans (E.)	Oaxaca, „	8,000
Solanum (W.) cardiophyllum (E.)	Mexico.	8,000 to 9,000
—— demissum (E.)	Mexico.	8,000 to 9,000
—— piliferum (E.)	Fuego, Guatemala.	8,300
—— squamulosum (E.)	Real del Monte, Mexico.	8,000
—— verrucosum (E.)	Orizaba, „	10,000 to 12,000
Physalis (W.) hirsuta (E.)	Fuego, Guatemala.	8,300
Saracha (A.) laxa (E.)	Oaxaca, Mexico.	6,000 to 8,000
—— umbellata (A.)	Orizaba, „	10,000
Nectouxia (E.) formosa (E.)	Real del Monte, Mexico.	8,500
Cestrum (S.) nitidum (E.)	Oaxaca, „	6,000 to 8,000
Nierembergia (A.) angustifolia (E.)	Real del Monte, „	8,000 to 9,000
Calceolaria (A.*) mexicana (E.)	Oaxaca, „	8,500
	Orizaba, „	10,000
—— trilobata (E.)	Fuego, Guatemala.	7,000 to 10,000
Alonsoa (A.) caulialata (A.)	Fuego, „	8,300
Pentstemon (W.†) gentianoides (E.)	Orizaba, Mexico.	9,000 to 12,000
	Fuego, Guatemala.	10,000 to 11,000
—— perfoliatus (E.)	Oaxaca, Mexico.	9,000 to 10,000
Mimulus (W.) glabratus (A.)	Orizaba, „	12,000 to 12,500
	Moran, „	8,000
—— orizabæ (E.)	Orizaba, „	10,000 to 12,000
Sibthorpia (W.) pichinchensis (A.)	Orizaba, „	9,000 to 12,000
	Oaxaca, „	9,000
Veronica (W.) serpyllifolia (W.)	Orizaba, „	12,000
Seymeria (W.) virgata (E.)	Villalpando, „	8,000
	Oaxaca, „	7,500
Castilleja (W.†) fissifolia (A.)	Irazu, Costa Rica.	11,000
—— irasuensis (E.)	Irazu, „	9,000 to 11,000
—— lithospermoides (E.)	Real del Monte, Mexico.	8,000

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* And New Zealand.

† Only North-eastern Asia.

		feet.
Castilleja lithospermoides (E.)	Moran, Mexico.	8,000
	Orizaba, ,,	12,000
—— moranensis (E.)	Pachuca, ,,	8,000
	Toluca, ,,	8,500
—— pectinata (E.)	Orizaba, ,,	9,800 to 12,000
—— tenuifolia (E.)	Oaxaca, ,,	3,000 to 8,000
—— tolucensis (E.)	Toluca, ,,	8,250 to 12,000
	Orizaba, ,,	13,000
Lamourouxia (A.) macrantha (E.)	San Felipe, ,,	8,000 to 9,000
	Orizaba, ,,	8,000 to 9,500
—— multifida (E.)	Oaxaca, ,,	4,500 to 9,000
—— ovata (E.)	Oaxaca, ,,	8,000
Pedicularis (W.) orizabæ (E.)	Orizaba, ,,	12,000
	Oaxaca, ,,	9,000
Pinguicula (W.) caudata (E.)	Orizaba, ,,	9,500
—— heterophylla (E.)	Oaxaca, ,,	8,000 to 9,000
Achimenes (S.) foliosa (E.)	Oaxaca, ,,	8,000
—— lanata (E.)	Oaxaca, ,,	6,000 to 8,000
Bignonia (N. & S.) ghiesbreghtii (E.)	Toluca, ,,	8,200
Lippia (W.) callicarpæfolia (A.)	Mexico.	10,000
Verbena (W.) teucriifolia (E.)	Orizaba, Mexico.	10,500
Cunila (N. & S.) polyantha (E.)	Fuego, Guatemala.	6,500 to 10,500
Calamintha (W.) macrostema (E.)	Vera Cruz, Mexico.	7,000 to 8,500
Dekinia (E.) coccinea (E.)	Totozinapa, ,,	8,000
Sphacele (W.) alpina (E.)	Irazu, Costa Rica.	9,600 to 11,000
Salvia (W.) biserrata (E.)	Orizaba, Mexico.	9,000 to 10,500
—— brevicalyx (E.)	Oaxaca, ,,	7,000 to 8,000
—— chrysantha (E.)	Irazu, Costa Rica.	9,000
—— coccinea (N. & S.)	Oaxaca, Mexico.	8,000
—— comosa (E.)	Toluca, ,,	8,000
—— elegans (E.)	Orizaba, ,,	9,000
	Fuego, Guatemala.	8,300
—— fulgens (E.)	Toluca, Mexico.	9,400
—— glechomæfolia (E.)	Guanajuato, ,,	8,800
—— herbacea (E.)	Oaxaca, ,,	9,000
—— linifolia (E.)	Morelia, ,,	8,000
—— martensii (E.)	Oaxaca, ,,	8,000 to 9,000
—— nana (E.)	Guanajuato, ,,	8,500
—— nervata (E.)	Oaxaca, ,,	8,000 to 9,000
—— oblongifolia (E.)	Oaxaca, ,,	8,500
—— patens (E.)	Real del Monte, Mexico.	7,500 to 8,000
—— purpurascens (E.)	Orizaba, ,,	9,000
—— reticulata (E.)	Oaxaca, ,,	8,000 to 9,000
—— stolonifera (E.)	Oaxaca, ,,	8,500
—— tricuspidata (E.)	Oaxaca, ,,	7,500 to 9,000
Scutellaria (W.) cærulea (E.)	Orizaba, ,,	9,000 to 10,000
Stachys (W.) galeotti (E.)	Real del Monte, ,,	7,500 to 8,000

			feet.
Stachys keerlii (E.)	Oaxaca,	Mexico.	8,000
—— parvifolia (E.)	Moran,	,,	7,500 to 8,000
—— pilosissima (E.)	Oaxaca,	,,	8,000
—— repens (E.)	Orizaba,	,,	9,500 to 11,000
Plantago (W.) galeottiana (E.)	Oaxaca,	,,	9,000
Eriogonum (N.) undulatum (E.)	Real del Monte,	,,	8,000
Muehlenbeckia (W.) tamnifolia (A.)	Orizaba,	,,	7,000 to 8,000
Peperomia (W.) lindeniana (E.)	Orizaba,	,,	10,000
—— œrstedii (E.)	Irazu, Costa Rica.		8,000
Hedyosmum (S.) calloso-serratum (E.)	Irazu, ,,		9,000
Persea (W.) orizabæ (E.)	Orizaba, Mexico.		7,500 to 10,500
Litsea (W.) glaucescens (E.)	Orizaba, ,,		9,750
	Real del Monte, Mexico.		8,000
	Las Vegas,	,,	7,000 to 8,000
—— neesiana (E.)	Oaxaca,	,,	8,000 to 9,500
Loranthus (W.) surinamensis (S.)	Irazu, Costa Rica.		6,000 to 8,000
Arceuthobium (W.) campylopodum (E.)	Orizaba, Mexico.		10,000 to 11,000
—— cryptopodum (N.)	Orizaba, ,,		10,000 to 11,000
—— oxycedri (W.)	Orizaba, ,,		12,000
Phoradendron (N. & S.) sqamigerum (E.)	Irazu, Costa Rica.		11,000
Euphorbia (W.) furcillata (E.)	Moran, Mexico.		7,000 to 8,000
	Real del Monte, Mexico.		7,000 to 8,000
	Pachuca,	,,	7,000 to 8,000
—— orizabæ (E.)	Orizaba,	,,	8,000 to 10,000
Croton (W.) incanus (E.)	Actopan,	,,	8,700
Stillingia (W.) acutifolia (E.)	Fuego, Guatemala.		8,300
Urtica (W.) chamædryoides (N.)	Orizaba, Mexico.		10,000
—— nicaraguensis (E.)	Irazu, Costa Rica.		8,700
—— spiralis (E.)	Oaxaca, Mexico.		8,000 to 9,000
	Orizaba, ,,		10,000
Urera (W.) baccifera (S.)	Irazu, Costa Rica.		9,000
—— caracasana (S.)	Irazu, ,,		8,000
Pilea (W.) vulcanica (E.)	Orizaba, Mexico.		10,000
Parietaria (W.) pennsylvanica (N.)	Orizaba, ,,		10,000
Alnus (W.) acuminata (A.)	Orizaba, ,,		7,000 to 10,000
—— jorullensis (E.)	Orizaba, ,,		8,000 to 10,000
Quercus (W.) citrifolia (E.)	Irazu, Costa Rica.		9,000
—— costaricensis (E.)	Irazu, ,,		8,000 to 10,000
—— depressa (E.)	San Andres, Mexico,		9,000 to 10,000
—— flavida (E.)	Chinantla,	,,	7,000 to 8,000
—— floccosa (E.)	Orizaba,	,,	8,000 to 10,000
—— ghiesbreghtii (E.)	Orizaba,	,,	7,000 to 8,000
—— glabrescens (E.)	Orizaba,	,,	8,000 to 10,000
—— insignis (E.)	Orizaba,	,,	7,000 to 9,500
—— lanigera (E.)	Misteca Alta,	,,	6,500 to 8,000
—— orizabæ (E.)	Orizaba,	,,	8,000 to 10,000
—— reticulata (E.)	Yavezia,	,,	8,000 to 10,000

		feet.
Quercus reticulata (E.)	Oaxaca, Mexico.	8,000 to 10,000
	Orizaba, ,,	8,000 to 10,000
Salix (W.) bonplandiana (E.)	Moran, ,,	7,600 to 8,100
	Cabrera, ,,	7,600 to 8,100
	Omitlan, ,,	7,600 to 8,100
	Pachuca, ,,	7,600 to 8,100
—— cana (E.)	Orizaba, ,,	11,000 to 12,000
—— hartwegi (E.)	Real del Monte, Mexico.	7,500 to 8,500
	Moran, ,,	7,500 to 8,500
—— latifolia (E.)	Orizaba, ,,	12,000
—— paradoxa (E.)	Moran, ,,	8,000
Juniperus (W.) flaccida (E.)	Regla, ,,	6,000 to 8,000
—— mexicana (E.)	Mineral del Monte, ,,	8,000 to 10,000
	Tenancingo, ,,	7,000 to 8,000
—— tetragona (E.)	Orizaba, ,,	12,000 to 14,000
Pinus (W.) ayacahuite (E.)	Popocatepetl, ,,	11,000 to 12,000
	Agua, Guatemala.	10,000 to 12,000
—— cembroides (E.)	Zimapan, Mexico.	8,000 to 10,000
—— hartwegii (E.)	Campanario, ,,	9,000
	Popocatepetl, ,,	13,000 to 14,000
—— leiophylla (E.)	Orizaba, ,,	7,000 to 9,000
—— montezumæ (E.)	Orizaba, ,,	10,000 to 14,000
	Ajusca, ,,	10,000 to 11,000
—— oocarpa (E.)	Yavezia, ,,	7,000 to 8,000
	Oaxaca, ,,	7,000 to 8,000
	Chinantla, ,,	7,000 to 8,000
—— patula (E.)	Orizaba, ,,	10,000 to 12,000
—— pinceana (E.)	Cuernavaca, ,,	8,000 to 9,000
Abies (W.) religiosa (E.)	Orizaba, ,,	9,000 to 10,500
	El Guarda, ,,	8,400
Arpophyllum (S.) alpinum (E.)	Totonicapan, ,,	10,000
—— spicatum (E.)	Oaxaca, ,,	7,000 to 8,500
Microstylis (W.) fastigiata (E.)	Oaxaca, ,,	8,000
—— hastilabia (E.)	Barba, Costa Rica.	8,000
—— lagotis (E.)	Barba, ,,	9,000
—— macrostachya (E.)	Anganguio, Mexico.	9,000
	Oaxaca, ,,	8,000
—— umbellulata (S.)	Oaxaca, ,,	8,500
Corallorhiza (W.) mexicana (E.)	Oaxaca, ,,	7,000 to 9,000
Hexadesmia (S.) crurigera (E.)	Irazu, Costa Rica.	9,000
Isochilus (S.) linearis (S.)	Irazu, ,,	10,000
Epidendrum (N. & S.) brassavolæ (E.)	Chiriqui, Panama.	8,000
—— erubescens (E.)	Oaxaca, Mexico.	7,500 to 8,500
—— imbricatum (S.)	Costa Rica.	9,000 to 10,000
—— ochraceum (E.)	Irazu, Costa Rica.	8,000
—— pallens (E.)	Barba, ,,	9,000
—— pentadactylum (E.)	Irazu, ,,	9,000

		feet.
Epidendrum teres (E.)	Irazu, Costa Rica.	10,000
Cattleya (S.) citrina (E.)	Oaxaca, Mexico.	7,000 to 10,000
Lælia (S.) furfuracea (E.)	Oaxaca, ,,	7,500 to 8,500
—— majalis (E.)	San Bartolo, ,,	8,000
Govenia (W.) liliacea (E.)	Oaxaca, ,,	7,500 to 8,500
—— sp. (E.)	Jesus del Monte, Mexico.	7,000 to 8,000
Xylobium (S.) stachyobiorum (E.)	Chiriqui, Panama.	6,000 to 8,000
Acineta (A.) sella-turcica (E.)	Chiriqui, ,,	6,000 to 8,000
Mormodes (A.) colossus (E.)	Turrialba, Costa Rica.	9,000
Cycnoches (S.) aureum (E.)	Chiriqui, Panama.	6,000 to 8,000
Odontoglossum (A.) cariniferum (E.)	Chiriqui, ,,	9,000
—— chiriquense (E.)	Chiriqui, ,,	8,000
—— galeottianum (E.)	Oaxaca, Mexico.	7,000 to 8,000
—— œrstedii (E.)	Irazu, Costa Rica.	9,000
—— sp. (E.)	Oaxaca, Mexico.	7,500 to 9,000
—— sp. (E.)	Oaxaca, ,,	8,000 to 9,000
Oncidium (S.) ansiferum (E.)	Chiriqui, Panama.	8,000
—— bracteatum (E.)	Chiriqui, ,,	6,000 to 9,000
—— cheirophorum (E.)	Chiriqui, ,,	8,000
—— graminifolium (E.)	Oaxaca, Mexico.	8,000 to 9,000
—— ochmatochilum (E.)	Chiriqui, Panama.	8,000
—— suave (E.)	Oaxaca, Mexico.	7,000 to 8,000
Sobralia (S.) lindleyana (E.)	Chiriqui, Panama.	9,000
Habenaria (W.) vulcanica (E.)	Orizaba, Mexico.	10,000 to 12,000
	Oaxaca, ,,	11,000
Selenipedium (A.) longifolium (E.)	Chiriqui, Panama.	5,000 to 8,000
Sisyrinchium (W.) affine (E.)	Real del Monte, Mexico.	8,000
—— micranthum (E.)	Cerro Ventoso, ,,	7,500 to 8,000
—— scabrum (A.)	Orizaba, ,,	10,000
Bomarea (A.) acutifolia (E.)	Orizaba, ,,	7,000 to 10,000
	Fuego, Guatemala.	8,300
—— hirtella (E.)	Toluca, Mexico.	8,800
Furcrœa (N. & S.) longæva (E.)	Tanga, ,,	10,000
Smilax (W.) moranensis (E.)	Orizaba, ,,	8,000
Smilacina (W.) salvini (E.)	Atitlan, ,,	9,000
—— scilloidea (E.)	Oaxaca, ,,	8,000 to 9,000
—— sp. (E.)	Fuego, Guatemala.	8,300
Echeandra (S.) terniflora (S.)	Oaxaca, Mexico.	8,000
	Orizaba, ,,	11,000
Allium (W.) glandulosum (E.)	Orizaba, ,,	8,500 to 12,000
Stenanthium (W.) frigidum (E.)	Orizaba, ,,	9,000 to 12,500
	Anganguio, ,,	9,000
Zygadenus (W.) mexicanus (E.)	Oaxaca, ,,	9,000
—— vulcanicus (E.)	Agua, Guatemala.	11,000
Commelina (W.) elliptica (E.)	Real del Monte, Mexico.	8,000
Tinantia (N. & S.) fugax (N. & S.)	Fuego, Guatemala.	8,300
Tradescantia (N. & S.) crassifolia (E.)	Cerro Ventoso, Mexico.	7,500 to 8000

		feet.
Tradescantia holosericea (E.)	Oaxaca, Mexico.	7,000 to 8,000
	Cerro de S. Andres, Mexico.	8,000 to 9,000
—— nana (E.)	Cerro de S. Felipe, „	8,000
Weldenia (E.) candida (E.)	Agua, Guatemala.	14,000
Juncus (W.) mexicanus (S.)	Orizaba, Mexico.	12,000
	Chapultepec, „	7,200 to 8,250
	San Augustin, Mexico.	7,200 to 8,250
	Real del Monte, „	7,200 to 8,250
Luzula (W.) caricina (E.)	Chinantla, „	7,000 to 8,000
	Oaxaca, „	8,000
	Orizaba, „	10,000
—— denticulata (E.)	Vaqueria del Jacal, Mexico.	10,000
—— gigantea (A.)	Orizaba, Mexico.	10,000
	Cumbre de Ixtepec, Mexico.	10,000
—— racemosa (A.)	Orizaba, „	10,000 to 14,000
Cyperus (W.) elegans (W.)	Nevada de Toluca, „	10,000
—— seslerioides (S.)	Morelia, „	7,000 to 8,000
Heleocharis (W.) radicans (E.)	Oaxaca, „	9,000
Carex (W.) cortesii (E.)	Sempoaltepec, „	10,000
—— festiva (W.)	Orizaba, „	10,000 to 12,500
—— jamesoni (A.)	Orizaba, „	12,500
—— liebmanni (E.)	Oaxaca, „	8,000 to 8,500
—— olivacea (E.)	Orizaba, „	10,000
—— physorhyncha (E.)	Chinantla, „	7,500 to 8,000
—— spilocarpa (E.)	Orizaba, „	8,000 to 10,000
Leersia (W.) hexandra (W.)	Valley of Mexico, „	10,500
Trachypogon (W.) angustifolius (E.)	Santa Rosa, „	8,040
Hierochloe (W.) mexicana (E.)	Oaxaca, „	8,000
Aristida (W.) scabra (E.)	Toluca, „	8,040
Stipa (W.) jarava (A.)	Moran, „	7,800 to 8,400
	Chinantla, „	8,000
	Orizaba, „	8,000
Muehlenbergia (W.) glabrata (E.)	Santa Rosa, „	8,000
	Cañada de Acabuca, „	8,000
—— mucronata (E.)	Guanajuato, „	7,620 to 8,150
—— quadridentata (E.)	Orizaba, „	12,500
—— stipoides (A.)	Orizaba, „	8,000
Phleum (W.) alpinum (W.)	Orizaba, „	10,000 to 12,000
Epicampes (A.) lanata (E.)	Villalpanda, „	7,800 to 8,760
	Santa Rosa, „	7,800 to 8,760
	Cerro del Cubilete, „	7,800 to 8,760
—— macroura (A.)	Orizaba, „	10,000 to 12,500
	Toluca, „	10,500
Agrostis (W.) setifolia (E.)	Orizaba, „	10,000
—— tolucensis (E.)	Toluca, „	7,000 to 8,000
	Orizaba, „	12,500 to 14,000
—— varians (E.)	Orizaba, „	12,000 to 12,500

			feet.
Agrostis virescens (E.)	Toluca,	Mexico.	7,000 to 8,000
	Orizaba,	,,	12,500
Achæta (E.) plumosa (E.)	Orizaba,	,,	10,000
Deyeuxia (W.) evoluta (E.)	Orizaba,	,,	11,000
—— junciformis (E.)	Toluca,	,,	7,000 to 8,000
—— liebmanniana (E.)	Orizaba,	,,	14,000 to 15,300
—— orizabæ (E.)	Orizaba,	,,	11,000 to 12,000
—— schiedeana (E.)	Orizaba,	,,	10,000 to 12,500
—— tolucensis (E.)	Toluca,	,,	8,200 to 14,000
—— triflora (E.)	Orizaba,	,,	8,000 to 10,000
Deschampsia (W.) koelerioides (E.)	Toluca,	,,	8,800
Trisetum (W.) gracile (E.)	La Hoya,	,,	7,000 to 8,000
—— interruptum (E.)	Vaqueria del Jacal,	,,	10,000
—— paniculatum (E.)	Oaxaca,	,,	9,000 to 10,000
—— tolucense (E.)	Toluca,	,,	8,250
	Orizaba,	,,	11,000 to 14,000
Atheropogon (N.) stolonifer (E.)	Oaxaca,	,,	8,500
Opizia (E.) stolonifera (E.)	Oaxaca,	,,	8,500
Poa (W.) conglomerata (E.)	Toluca,	,,	8,800
	Orizaba,	,,	12,000
—— infirma (E.)	Popocatepetl,	,,	12,000
Graphephorum (W.) altijugum (E.)	Orizaba,	,,	12,000 to 14,000
Festuca (W.) æquipaleata (E.)	Orizaba,	,,	14,000
—— amplissima (E.)	Orizaba,	,,	10,000
—— fratercula (E.)	Orizaba,	,,	11,000 to 12,000
—— hephæstophila (E.)	Orizaba,	,,	12,500
—— livida (E.)	Orizaba,	,,	13,000 to 13,500
—— tolucensis (E.)	Toluca,	,,	14,000
	Islahuaca,	,,	8,280
	Vaqueria del Jacal,	,,	10,000
	Orizaba,	,,	14,000
—— sp. (E.)	Fuego, Guatemala.		12,000
Bromus (W.) anomalus (E.)	Real del Monte, Mexico.		8,000
	Cerro de San Felipe, Mexico.		8,000
	Oaxaca,	Mexico.	8,000
—— exaltatus (E.)	Orizaba,	,,	10,000 to 11,000
Brachypodium (W.) subulatum (E.)	Orizaba,	,,	12,000 to 14,000
Chusquea (A.) galeottiana (E.)	Oaxaca,	,,	8,000
Guadua (S.) flabellata (E.)	Orizaba,	,,	9,000
Alsophila (W.) pruinata (S.)	Sempoaltepec	,,	9,000 to 10,000
Cystopteris (W.) fragilis (W.)	Orizaba,	,,	12,500
Adiantum (W.) capillus-veneris (W.)	Orizaba,	,,	10,000
—— glaucophyllum (E.)	Orizaba,	,,	9,500 to 9,750
	Oaxaca,	,,	8,000 to 8,500
Cheilanthes (W.) farinosa (W.)	Chinantla,	,,	7,000 to 8,000
—— lendigera (N. & S.)	Chinantla,	,,	9,500 to 10,000
	Orizaba,	,,	9,500 to 11,500

		feet.
Cheilanthes lendigera (N. & S.)	Vaqueria del Jacal, Mexico.	10,000
—— microphylla (N. & S.)	Oaxaca, Mexico.	8,000
—— scariosa (A.)	Orizaba, „	12,000
—— speciosissima (E.)	Orizaba, „	10,000 to 12,000
Asplenium (W.) filix-fœmina (W.)	Orizaba, „	9,500 to 12,000
—— monanthemum (W.)	Mexico.	1,000 to 11,500
—— trichomanes (W.)	Mexico.	to 11,000
	Alotenango, Mexico.	above 11,000
	Fuego, Guatemala.	above 11,000
Nephrodium (W.) sphærocarpum (E.)	Real del Monte, Mexico.	8,000
Polypodium (W.) heteromorphum (A.)	Orizaba, „	10,000 to 12,000
—— lanceolatum (W.)	Orizaba, „	9,000 to 12,000
—— moniliforme (A.)	Orizaba, „	9,000 to 12,000
—— plebeium (S.)	Coban, Guatemala.	8,000 to 10,000
	Fuego, „	8,000 to 10,000
—— rigescens (W.)	Cerro de Pelado, Mexico.	7,000 to 10,000
Notholæna (W.) aschenborniana (N.)	Oaxaca, „	8,000
Gymnogramme (W.) pilosa (E.)	Orizaba, „	9,760 to 10,000
Antrophyum (W.) ensiforme (E.)	Totontepec, „	10,000
Acrostichum (W.) lepidotum (S.)	Orizaba, „	10,000 to 11,000
—— lindeni (S.)	Orizaba, „	9,000 to 10,000
—— mathewsii (A.)	Orizaba, „	9,500 to 11,000
—— simplex (S.)	Orizaba, „	10,000
—— squamipes (S.)	Sempoaltepec, „	8,000 to 9,000
—— tectum (S.)	Chinantla, „	7,000 to 8,000
Marattia (W.) alata (S.)	Oaxaca, „	7,000 to 8,000
Lycopodium (W.) clavatum (W.)	Sempoaltepec, „	11,000 to 12,000

Analysis of the Distribution of the Genera and Species in the foregoing list.

Genera.					
Endemic.	Extending to				
	North America.	South America.	Andes only.	N. and S. America.	Beyond America.
13	9	25	22	26	165

America	82=	31·6 per cent.
Endemic	13=	5·0 „
Of wider range	165=	63·4 „
Total	260	100·0

Species.					
Endemic.	Extending to				
	North America.	South America.	Andes only.	N. and S. America.	Beyond America.
504	17	19	39	8	17

America	83 =	13·8	per cent.
Endemic........	504 =	83·4	,,
Of wider range ..	17 =	2·8	,,
Total......	604	100·0	

The description at p. 145 conveys a very good idea of the vegetation of the peak of Orizaba, and the preceding analysis gives a clue to the relationships of the mountain flora of South Mexico and Central America generally. North Mexico is excluded because it clearly belongs to a distinct subregion extending northward into the central territories of the United States. For the purpose under consideration we have drawn up the foregoing list of all the plants in our Enumeration, recorded as occurring at altitudes of 8000 feet and upwards, from data on the labels of the various collectors. It will be understood that this list is merely a sample of the flora, and it might easily be extended by including the species which we know from other sources * grow above the limit named, to say nothing of those which are evidently mountain plants, though we have no actual authority for it; but under any circumstances we could not make the list approximately complete, therefore it seems better to restrict it in the manner stated. On the other hand, it is probable that some of the plants included do not ascend quite so high as 8000 feet, notwithstanding that the range given is up to that altitude.

The figures in this analysis are perhaps the most interesting we have obtained, for they show, more distinctly than those of the general table even, the strong southern affinity of the flora of South Mexico. We also see what a large proportion of the generic types of the highest zone of vegetation are of wide range. Very few indeed of the peculiarly American or peculiarly Mexican forms reach the altitudinal limits of vegetation. Such genera as *Clusia*, *Amicia*, *Calliandra*, *Pleroma*, *Miconia*, *Begonia*, *Ravnia*, *Psychotria*, *Myrsine*, *Ardisia*, *Achimenes*, and many others occur only in the lower part of the range indicated.

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* Thus, on referring to the Sketch of the Vegetation of the Peak of Orizaba (p. 145) we learn that the additional genera *Tilia*, *Cratægus*, *Cotyledon*, *Chamædorea*, *Agave*, *Smilax*, *Tillandsia*, *Tigridia*, *Arundinaria*, and others ascend to above 8000 feet; and the number of orchids would have been very much higher had we included all those recorded above 8000 feet by Richard and Galeotti (see p. 303).

ALTITUDINAL DISTRIBUTION OF ORCHIDS IN SOUTH MEXICO, AND THE DOMINATING FEATURES OF THE GENERAL VEGETATION.

THE general distribution of orchids is discussed with some fulness in a preceding paragraph (p. 267); and here we propose reviewing the salient features of their distribution in South Mexico, especially in relation to the sequence in which the various types appear in ascending from the coast to their upper limits on the mountain-peaks, and also, briefly, in relation to the characteristic plants with which they are associated in the successive zones. Too much importance must not be attached to the actual heights given, because they greatly vary for the same genera and species, according to situation, aspect, and other local conditions. The data are almost wholly extracted from an article by Richard and Galeotti *, compiled from Galeotti's own observations, supplemented by those of Linden, Ghiesbreght, Hartweg, Andrieux, and other travellers. Their zonal divisions, though perhaps not the best that could be devised, are adopted, as any deviations therefrom would deprive the sketch of much of its value. Metres have been roughly reduced to feet.

1. *The Tropical or Hot Region.*—This is divisible into two subregions. The vegetation covering the slopes of the cordillera from the sea-shore up to an approximate altitude of 3250 feet is tolerably uniform in character. Little else than prickly mimosas, tall grasses, and arboreous bignonias is to be seen, though here and there the burning solitude is relieved by patches of verdure looking like so many oases. From the end of October until June this desolate region is scorched up and almost inanimate. But there is a region within a region in this zone, formed by the numerous ravines which serpentine through the plains, and shelter a rich and varied vegetation. Prominent among the trees are:—*Cecropia*, *Castilloa elastica*, various species of *Bignonia* and *Zamia*, with such orchids as *Schomburgkia tibicinis* and various *Oncidia* having cylindrical fleshy leaves. Even in the small ravines which pierce the dunes near Vera Cruz *Mormodes pardina* and *Chysis aurea* grow, hidden in the darkest and most humid localities, whilst the *Cyrtopodia* attach their long pseudobulbs to the basaltic rocks in the most exposed and sunny situations. The nearer we approach the cordillera the richer are these ravines in interesting and curious plants, the rock varying in composition in different States. Thus in Vera Cruz it is basaltic; in Tamaulipas calcareous; and schistose or gneissic in Oaxaca, embellished with dwarf palms of the genus *Chamædorea*; various ferns, such as *Aspidium serra*, *A. heracleifolium*, *Adiantum villosum*, *Polypodium cordifolium*, and *Lygodium polymorphum*; *Ficus* of kinds, *Cecropia*; showy Gesneraceæ, as *Gloxinia guttata* †, *Episcia rosea*, and *Achimenes grandiflora*; the tall

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* "Monographie des Orchidées Mexicaines, précédée de considérations générales sur la Végétation du Mexique et sur les diverses stations ou croissent les espèces d'Orchidées Mexicaines." Par A. Richard et H. Galeotti. Comptes Rendus des séances de l'Académie des Sciences, xviii. 1844.

† Some of the names cited in this sketch stand as synonyms in our Enumeration, while a few others, chiefly of orchids, given by Richard and Galeotti, have not been connected with their respective species by subsequent botanists.

grass, *Pennisetum distachyum*, which grows fifteen to twenty feet high; an infinite variety of Begoniæ and Apocynaceæ growing in tufts on the water's edge, interspersed with terrestrial orchids such as *Habenaria spathacea*, *H. diffusa*, *H. lactiflora*, *Ponthieva oblongifolia*, and *Spiranthes saccata*.

Associated with these shrubby and herbaceous elements are many lofty trees belonging to the Leguminosæ, Sapotaceæ, Combretaceæ, Malpighiaceæ, Meliaceæ, &c., clothed with a variety of epiphytes of the genera *Pothos* and *Begonia* and numerous orchids, among them *Stanhopea tigrina*, *S. saccata*, *Maxillaria aromatica*, *Epidendrum ancipticaulon*, *E. rigidum*, *E. candollei*, *Pleurothallis microphylla*, *Oncidium sphacelatum*, *O. stramineum*, *Cœlia baueriana*, *Zygopetalum grandiflorum*, and *Ponera striata*.

This rich and varied vegetation constitutes a region quite different from that of the coast, and it may be designated the warm temperate region of the ravines.

The districts situated between 3250 and 4000 feet of absolute height present an intermixture of the plants of the hot humid regions and those of regions enjoying a much lower temperature. Thus even at elevations of about 3000 feet, oaks begin to appear, whereas the gigantic *Persea gratissima* of lower altitudes ceases to show itself, and the sapodilla, papaw, and large species of fig become rare, while ferns, Rubiaceæ, *Symplocos*, *Turpinia insignis*, *Berberis tenuifolia*, and Gesneraceæ abound.

2. *The Temperate Region.*—The great temperate region of the eastern side of the cordilleras of Mexico may be divided into three subregions, the whole of which constitutes a zone situated between 3000 and 5900 feet, or even up to 6500 feet of absolute height.

First Subregion: Warm Temperate.—This is situated on the confines of the tropical regions, and retains certain elements of the same vegetation, associated, however, with a large number of different species, many of which ascend to altitudes of 6500 feet. It is specially characterized by its oak-forests, composed of several species, various Gentianaceæ, *Zamia*, *Ruyschia*, and Orchideæ. Prominent among the last are numerous species of *Stanhopea*, *Brassavola glauca*, *Cyrtochilum maculatum*, *Epidendrum radiatum*, *E. parkinsonianum*, and other species which grow on the bark of the oak trees. *Cypripedium irapeanum*, *Habenaria spathacea*, and *Corallorhiza mexicana* flourish in the shade of the oak-forests, while *Spiranthes aurantiaca*, *S. saccata*, *S. violacea*, and *Bletia coccinea* affect the savanas, half concealed among such grasses as *Manisurus granularis*, *Elionurus ciliaris*, *Andropogon anthistirioides*, *Panicum sylvaticum*, &c.

The neighbourhood of Jalapa (Coatepec, Jilotepec, Zacuapan, &c.) and Orizaba, and the greater part of the magnificent country stretching along the eastern side of the cordillera of Oaxaca and bearing the name of Chinantla, belong to this subregion, the extensive savanas of which are characterized by Malpighiaceæ, Mimoseæ, *Escobedia lævis*, &c. Here the soil is usually arid, though the rains are frequent, but here and there groups of taller trees relieve the monotony of the vast expanses.

Second Subregion: Temperate, or Region of Tree-ferns.—This is the region which in

Mexico bears the name of "templada," and it is the most fertile of all, producing everything that is needful for the sustenance and pleasure of man. It extends over an average vertical range of 2000 to 2300 feet. In the States of Vera Cruz and Tamaulipas * it commences at elevations of 3250 to 3950 feet and terminates between 5900 and 6500 feet; in Oaxaca and Tabasco it begins and finishes some 600 feet higher. Tree-ferns, *Liquidambar*, and *Stanhopea* are highly characteristic. The mean temperature varies from about 63° to 66°, and the atmosphere is constantly humid; hence there is perpetual verdure, and the flora is the richest and most varied in the country. It embraces Jalapa and the surrounding forests, San Andres, Mirador, Chiconquiaco, Totutla, and all the belt of forests which extends from Orizaba to Villa Alta, Tonaquia, Teotalcingo, and up to the Guatemalan frontier †.

The orchids of this region include nearly all the species of *Stanhopea*, *Mormodes*, and *Catasetum*, *Trichopilia tortilis*, *T. galeottiana*, *Isochilus latibracteatus*, *I. crassiflorus*, *Evelyna capitata*, *Maxillaria deppei*, *M. densa*, *M. hæmatochilum*, *M. cucullata*, *Epidendrum lindenianum*, *E. glaucum*, *E. polybulbon*, *E. candollei*, *E. discolor*, *E. nocturnum*, *E. rhynchophorum*, *Oncidium ornithorhynchum*, *O. incurvum*, *Odontoglossum hastatum*, *O. maculatum*, *O. lindleyi*, *Physosiphon ochraceum*, *Dichœa squarrosa*, *D. echinocarpa*, *Prescottia* sp., *Cranichis glandulosa*, *Physurus brachyceras*, and a host of others. Prominent among the plants associated with them are various species of *Begonia*, *Daphnopsis*, *Citrosma*, *Symplocos*, *Bejaria*, and *Clethra*, together with *Duranta jalapensis*, *Choisya ternata*, and *Thibaudia laurifolia*.

Third Subregion: *Temperate, or Region of Sarsaparilla and Jalap.*—The abundance of these two medicinal plants suggests the name for the region, which follows the last, but has neither tree-ferns nor *Liquidambar*. Among the orchid-types which disappear *Trichopilia*, *Mormodes*, and *Catasetum* may be mentioned; and *Stanhopea* is rare; while such genera as *Pinus*, *Arbutus*, and *Pyrola*, and various Rosaceæ, characteristic of a colder climate, begin to show themselves. The limits of this subregion are somewhat indefinite, ranging between 5900 and 7200 feet. The commoner orchids are:—*Epidendrum viscidum*, *E. lactiflorum*, *E. ligulatum*, *E. ledifolium*, *E. lineatum*, *Barkeria lindleyana*, and *B. skinneri*, growing indiscriminately on oak trees and rocks.

The slopes of the western cordilleras of Mexico, descending to the Pacific Ocean, and the whole of the detached mountain masses and ramifications in the States of Mechoacan, Jalisco, Puebla, Mexico, and Oaxaca, present an enormous extension of temperate region in which the flora generally is different from that of the eastern or Atlantic side of the cordillera. *Liquidambar* is wanting, and tree-ferns comparatively rare; but the most striking feature is the large number of species of oak, which often attain colossal dimensions. The orchids which live on the oaks are mostly different from those found on the eastern side; *Epidendrum cochleatum* and *E. radiatum* are perhaps the only epiphytal species common to both mountain chains. The moist ravines of Arumbaro shelter *Cypripedium irapeanum*, which here grows larger than in the vicinity of Jalapa. Other orchids of this region are: *Bletia coccinea*, *B. secunda*, *B. campanulata*, *Spiranthes aurantiaca*, *Habenaria lactiflora*, *Oncidium suttoni*, *O. galeottianum*, *Epidendrum viscidum*, *Malaxis myurus*, *Maxillaria cucullata*, *M. variabilis*, *Physosiphon carinatus*, and *Isochilus linearis*. In the State of Jalisco, *Bletia reflexa*, *Schomburgkia galeottiana*, and *Habenaria lactiflora* occur. *Lœlia grandiflora*, which belongs to the cold region, occasionally descends into this, for instance in the vicinity of Morelia.

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* We are unaware that Galeotti had any personal knowledge of this State, and the references to it here and elsewhere in this sketch are not in accordance with ascertained facts, except for the sea-board.

† Of course it is now very well known that this region should include similar districts of Guatemala.

The beautiful forests and gneissic rocks of Juquila, Zacaltepec, &c., in the State of Oaxaca, furnished a large number of new or interesting orchids; among others, *Epidendrum pulchellum*, *E. ramosum*, *E. ledifolium*, *E. oppositifolium*, *Gongora galeottiana*, *Lœlia peduncularis*, *Bletia purpurata*, various species of *Stanhopea*, *Malaxis galeottiana*, *Spiranthes pubens*, *S. orchioides*, *Habenaria adenantha*, and *Platanthera propinqua*.

3. *The Temperate Cactiferous Regions.*—The plains of some of the Mexican plateaus, and all the slopes descending into the central plains, are covered with a totally different vegetation from the humid sides of the cordilleras. The geological nature of the soil, the great rarefaction of the air, the little forest, the enormous radiation from the immense surface, the scarcity of rain and consequent absence of streams, combined, account for the almost universal barrenness of these plains and the very marked differences in the vegetation. Orchids are extremely rare, yet various species of *Lœlia* and *Spiranthes* are scattered here and there. Cactaceæ, on the contrary, abound, and are remarkable alike for their singular shapes and their brilliantly coloured flowers. *Prosopis dulcis* and sundry other spiny Mimoseæ cover large areas in the plains of Baxia, Guadalajara, Tepic, Tehuacan, and Oaxaca, while prickly Bromeliaceæ and formidably armed Agaves constitute nearly the whole of the vegetation of the calcareous and schistose soil of Zimapan, Izmiquilpan, and Mextitlan.

4. *The Cold Regions.*—The cold Alpine regions commence at elevations of about 7200 to 7500 feet, where there is an intermingling of temperate and alpine forms, but at elevations of from 8850 to 9200 feet the vegetation is more characterized. Various species of *Pinus*, *Quercus*, *Arbutus*, *Arctostaphylos*, *Pyrola*, and Rosaceæ give the scene quite a special character.

The cold regions of the cordillera may be divided into three subregions, namely: a lower, from 7550 to 8850; a middle, from 8850 to 10,800, or even to 11,500; and an upper, extending from the latter to the upper limits of phanerogamic vegetation.

The Lower Cold Region.—The following plants ascend more or less into this region: *Choisya ternata*, *Clethra mexicana*, *Elaterium floribundum*, *Lobelia hartwegi*, *L. persicifolia*, *Siegesbeckia jorullensis*, *Cerasus capollin*, *Cotoneaster denticulata*, *Cratægus pubescens*, *Spiranthes chloreæformis*, *S. pubens*, *Lœlia furfuracea*, *L. albida*, *Poly-*

stachya cerea, *Isochilus linearis*, *Epidendrum vitellinum*, &c.; but there is no *Stanhopea*, no *Cyrtopodium*, no *Acropera*, and no *Oncidium* with fleshy leaves; and pines and arbutuses begin to dominate.

To this subregion may be reckoned the neighbourhood of Oaxaca (declivities of the Cerro San Felipe), a part of the Misteca Alta (Piñoles, &c.); the Cerro de la Virgen, near Juquila, a few leagues distant from the Pacific Vcean; the neighbourhood of Sola, in the district of Gavezia (Socorra, Castrasana); the beautiful woods of Llano Verde, in the State of Oaxaca; the neighbourhood of Vigas, near Jalapa; a portion of the peak of Orizaba, near the Rancho de Torozinapa; the flanks of the Cofre de Perote; the mountains near Orizaba, &c. in the State of Vera Cruz; Jesus del Monte, near Morelia, and the mountains of Irapeo.

The Intermediate Cold Region.—This subregion is rich in orchids, and on the trachytic flanks of the peak of Orizaba some members of this order are found above 10,800 feet of absolute elevation, among them *Habenaria prasina.* It is characterized by handsome oaks and lofty pines, beneath which grow *Pyrola* and *Chimaphila.* Ferns abound, as also arboreous Ericaceæ (*Arbutus*, spp.) and Asclepiadeæ. The Cucurbitaceæ are represented by the solitary genus *Sicyos*; grasses increase with the altitude, and here, as on the coast, they are mostly tufted kinds, though such are very rare in the intervening regions. The forests shelter numerous Ranunculaceæ, Labiatæ, Gentianaceæ, herbaceous and frutescent Rosaceæ; and the marshy places are inhabited by species of *Eutoca*, various Umbelliferæ, and *Ophioglossum.* Finally, a few succulent plants are found on the elevated peaks near Oaxaca and Zimapatam; among them *Mamillaria nitida* and *M. polychlora.* There is a constant reign of humidity in the forests, and electrical discharges are frequent and violent. The mean temperature varies from 50° to 60°.

The cold regions of the two branches of the cordilleras abound in orchids, several of which are common to both. The richest localities lie between 8200 and 9200 feet of absolute altitude. Noteworthy among those inhabiting the eastern cordillera of Oaxaca are: *Epidendrum erubescens*, which fastens its long pseudobulbs on the trunks of oak trees, and develops flower-stems of the great length of thirty-five to forty feet; *Pleurothallis aurea*, *Cœlia macrostachya*, *Arpophyllum spicatum*, *Epidendrum guttatum*, *Malaxis myurus*, *Corallorhiza bulbosa*, *Epidendrum virgatum*, *E. varicosum*, *E. ledifolium*, *Govenia capitata*, *G. superba*, *Spiranthes galeottiana*, *Cattleya citrina*, *Epidendrum ligulatum*, *E. arbusculum*, *E. pruinosum*, *E sisyrinchiifolium*, *Odontoglossum cœrulescens*, *O. galeottianum*, *Oncidium graminifolium*, and *Alamania punicea.*

The oak-forests and gneissic rocks of the Misteca and of the western branch of the cordillera of Oaxaca present an equally rich orchid flora. Here is a specimen of it: *Odontoglossum membranaceum*, *Lœlia albida*, *L. furfuracea*, *Epidendrum erubescens*, *E. guttatum*, *E. costatum*, *E. pulchellum*, *E. subulatifolium*, *Pleurothallis mesophylla*, *Spiranthes pubens*, *Oncidium macropterum*, *O. rariflorum*, *Bletia purpurata*, and *Habenaria acutiflora.*

A host of beautiful orchids inhabit the forests of Mechoacan, especially around Morelia, in the Cerro de Quinzeo, in the woods of Jesus del Monte, Irapeo, &c., among them *Spiranthes cinnabarina*, *Habenaria acutiflora*, *Malaxis galeottiana*, and *Epidendrum puniceum*, as well as nearly all of those described by La Llave and Lexarza.

The forests of the cold regions bordering the central plateau also shelter a few orchids, including *Govenia superba*, *Corallorhiza mexicana*, and *Pleurothallis violacea.*

The Upper Cold Region.—Phanerogamic vegetation reaches the summits of the loftiest mountains. The heights of Popocatapetl, Iztaccihuatl, Toluca, Orizaba, and Cofre de Perote, ranging between 10,800 and 13,600 feet, constitute a cold region of a very special character, where Filices, Gentianaceæ, Ranunculaceæ, Gramineæ, and Coniferæ predominate. At altitudes of 12,100 to 12,800 feet alders and oaks cease, and pines become stunted and shrubby, trailing their branches on the ground. On the peak of Orizaba, at about 13,600 feet, junipers form here and there small patches of verdure on the trachytic rocks; but at this altitude vegetation has become very poor and scanty, for it is only on the margin of the rivulets, fed from the eternal snows above, that one finds a few diminutive Umbelliferæ, species of *Cnicus*, *Senecio*, Gentianaceæ, *Vaccinium geminiflorum*, *Allium fragrans*, *Carex galeottiana*, *Bromus subalpinus*, *Poa conglomerata*, and *Deyeuxia orizabæ.*

On the small flats of volcanic sand at the foot of the glaciers, from 13,800 to 14,100 feet in altitude, grow dwarf species of *Castilleja* with orange-scarlet flowers, two species of Compositæ, two species of Cruciferæ, and *Bromus lividus*; and cryptogams abound, especially lichens, covering the rocks, and running up to the limits of the snow, which varies at different points.

The orchids reaching the greatest elevations are: *Habenaria prasina*, *Platanthera nubigena*, *Spiranthes ochracea*, *Malaxis gracilis*, and *Platanthera longifolia*, which do not altogether cease below 12,500 to 12,800 feet on the peak of Orizaba.

Odontoglossum nebulosum and *Cattleya citrina* live on the tall oaks of the Cerro de Capulapam and the peak of San Andres at altitudes exceeding 10,500 feet, and they are doubtless the only epiphytal species that ascend to so great an elevation in Mexico. *Odontoglossum membranaceum*, *Oncidium graminifolium*, *Epidendrum virgatum*, *E. varicosum*, *E. puniceum*, *Govenia superba*, and *G. spicata* disappear at about 9850 feet.

On looking back and re-examining the comparative distribution of orchids in the three great regions defined, it will be apparent that the cold region is little behind the temperate region, either in the variety or beauty of species peculiar to it.

RECAPITULATION OF THE DOMINANT FEATURES OF THE FLORA OF MEXICO AND CENTRAL AMERICA, AND REMARKS ON ITS PROBABLE DERIVATION.

Writers on Phytogeography have treated the subject from various standpoints, and as diversely interpreted the phenomena of the distribution of plants. One of the initial difficulties is the definition of the boundaries of the different floral provinces or regions, which are necessarily more or less arbitrary conceptions; and on this point, especially, we encounter the most divergent opinions. Practically there is no limit to division and subdivision, except the degree of precision of the data and the extent of the area under consideration; and the designations 'floral kingdom,' 'zone,' 'province,' 'region,' and 'district' have no generally recognized meanings. Zoologists have an intelligible method of dealing with geographical facts; but it is hardly applicable to plants, because their distribution is so much more dependent on climatal conditions, and in almost all large countries there are distinct vertical as well as horizontal regions of vegetation. The horizontal or latitudinal divisions adopted in this work are explained on page 138 *, and the altitudinal range of the plants has been set forth as fully as the data will permit.

Grisebach's† Mexican floral province extends from Panama to the northern limit of the tropical zone, and is subdivided into vertical regions. Yucatan is regarded as a part of the 'West-Indian province,' while the eastern side of Central America is reckoned to the 'Cis-equatorial province.' This idea has not met with acceptance; and Engler‡ has devised a plan of division more in accordance with the facts, and closely approaching that proposed in this work. One of his primary divisions of the vegetation of the globe comprises the whole tropical flora of America, which he subdivides into four 'provinces,' namely:—South Brazil, North Brazil and Guiana, West Indies, and Subandine. The last includes Grisebach's Cis-equatorial province (except Guiana), tropical and subtropical Central America and Mexico below the region of oaks and pines, and the tropical and subtropical regions of the Andes. As Engler observes, each of these regions presents certain peculiarities in its flora, yet it seems better to treat them as parts of a whole. Engler regards the highlands of Mexico and Guatemala as subdivisions of a floral province; and he indicates the relationships between the flora of the dry uplands of Mexico and that of the country to the north. On his map Grisebach indicates his 'Prairie province' as extending southward to the tropics, though he does not appear to give it that extension in the text.

Drude§ includes an area embracing California, the Rocky Mountains, Texas, Virginia, Florida, &c., in a 'floral kingdom,' which he subdivides into four provinces; one of

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* See also the Map, Plate 110.

† Vegetation der Erde, p. 297.

‡ Versuch einer Entwicklungsgeschichte der Pflanzenwelt, ii. p. 187.

§ "Florenreiche der Erde," Petermann's Geographische Mittheilungen, Ergänzungsheft, No. lxxiv. p. 58.

which concerns us. In his own words:—"The fourth large province stretches from the southern boundaries of the Montana [Rocky Mountains] and Californian floral provinces, and from the very ill-defined western limits of the Atlantic States, in about 93° W. long., southward to the mouth of the Rio del Norte and away over the interior highlands to the Sierra Madre in Mexico, where it terminates in a point a little within the tropics, leaving the Atlantic and Pacific coasts up to the 27th parallel in the tropical province" *. This he names the province of Texas and North Mexico. The remainder of our territory comes within Drude's 'floral kingdom' of tropical America generally, though excluding the high Andes, and constitutes a province which he designates the Mexican. This province is nearly conterminous with Grisebach's; but it also includes Yucatan and the Atlantic side of Central America.

It is not our intention to discuss the merits of the divisions proposed by the authors cited. Collectively they contain most of the ideas of our own, which were suggested by a study of all the available material.

It cannot be denied, however, that the divisions adopted in this work, as indicated on the map at least, are also, to some extent, unsatisfactory and open to criticism, particularly as the northward extensions of tropical types in the coast regions, and the southward extensions of xerophilous types in the dry upland regions, are not shown. But these are defects of detail, largely due to imperfect data, and after all very slightly affecting any general conclusions, as evidenced by the synopsis of facts below.

The country investigated in this work extends through 24° of latitude, the northern limit being the thirty-third parallel on the western and the twenty-sixth on the eastern side, with an altitudinal range of about 17,000 feet within the tropics.

In the Enumeration habitats are recorded for the plants according to the political divisions of the country†, and they are tabulated on the same basis, with an ultimate reduction to three floral provinces—a northern, a central, and a southern. Unfortunately a large number of the Mexican plants in herbaria are so vaguely labelled that it is only from a knowledge of the itineraries of collectors that it has been possible to assign them to their respective provinces; but in some instances information on this point is wanting. In all calculations the Mexican plants of uncertain origin are added to the South-Mexican flora; but it was perhaps a little precipitate to assume that they all belonged to this province. Not that this course has unduly augmented the number of species inhabiting South Mexico, though the North-Mexican total may have thereby suffered a trifling reduction. Succulent plants, such as the Cactaceæ and those of the *Agave* and *Yucca* type, are largely known only from cultivated specimens, of Mexican

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[*] Ibid. p. 63.

[†] We have very few plants from Yucatan and British Honduras, almost nothing from Spanish Honduras, and although the general character of the vegetation of Nicaragua, Costa Rica, and Panama is known, it is far from having been exhaustively investigated.

origin certainly, but of what part it is often uncertain; still we now think some of them, perhaps a considerable number, may have been imported from the Northern States.

The Vascular Plants under consideration for the whole area number 12,233 species, referred to 1849 genera, belonging to 167 natural orders.

To begin with the Northern Province, which is the largest of the three, and roughly consists of the extratropical part of Mexico with a southward extension in the table-lands not indicated on our map, and indefinable extensions into Texas, New Mexico, and Arizona, &c., more fully discussed in the paragraphs, page 217 to 227.

Authenticated from within the Mexican portion of this floral province there are 3040 species of vascular plants belonging to 836 genera; and of the former 2930 are flowering plants, constituting a small fraction over a quarter of the number recorded from the whole of Mexico and Central America, yet probably far short of the number actually existing. Thirty-nine of the natural orders in the central and southern provinces are not known to be represented in the northern province. The absent orders are mostly essentially tropical, or consisting of hygrophilous plants.

The exceedingly sparse representation of the Melastomaceæ, Begoniaceæ, Passifloraceæ, Cucurbitaceæ, Gesneraceæ, Piperaceæ, Aristolochiaceæ, Scitamineæ, Bromeliaceæ, Orchideæ, and Palmæ is also evidently more the result of climatal conditions than the latitudinal position of the country.

Three orders, the Frankeniaceæ, Elatineæ, and Santalaceæ, represented by one species each, are not known to occur in the central and southern provinces. Among orders absolutely or relatively numerous in species are:—Cruciferæ, 44; Polygalaceæ, 27; Malvaceæ, 53; Malpighiaceæ, 21; Leguminosæ, 315; Crassulaceæ, 16*; Onagrarieæ, 28; Cactaceæ, 137*; Compositæ, 629; Asclepiadeæ, 52; Polemoniaceæ, 22; Hydrophyllaceæ, 21; Boragineæ, 47; Convolvulaceæ, 51; Solanaceæ, 52; Scrophularineæ, 72; Labiatæ, 77; Nyctagineæ, 36; Amarantaceæ, 33; Chenopodiaceæ, 20; Polygonaceæ, 25; Euphorbiaceæ, 129; Cupuliferæ, 22; Coniferæ, 25; Amaryllideæ, 23*, Liliaceæ, 35*; Gramineæ, 184; and there are 100 species of Filices, the majority belonging to xerophilous genera. Against this there are only twelve orchids recorded, and the two or three epiphytal ones among them are almost certainly not from this province; and thirty-four Cyperaceæ, while 170 species are recorded from South Mexico.

Here in this flora, or fragment of a flora, the Compositæ constitute 21 per cent. of the flowering plants; Leguminosæ 10 per cent.; Cactaceæ 4·6 per cent.; and Euphorbiaceæ 4·4 per cent. Noteworthy too is the large number of species of many other gamopetalous orders besides the Compositæ; and of such small orders as the Polemoniaceæ and Nyctagineæ, which find their greatest concentration in this province.

The number of grasses, though only half that of the smaller area of South Mexico, is proportionally high, forming 6·3 per cent. of the flowering plants, or nearly 2 per cent.

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* As explained above, these orders are probably represented by a considerably larger number of xerophilous members.

more than they constitute in the known flora from North Mexico to Panama. But here, as in the ferns, the xerophilous genera largely predominate, *Bouteloua*, *Sporobolus*, *Stipa*, and *Aristida* being numerous, and such monotypic genera as *Buchloe* and *Scleropogon* are characteristic. We have already fully detailed (page 272) the distribution of the genera *Beschorneria*, *Agave*, *Furcræa*, *Yucca*, *Nolina*, and *Dasylirion*, which have their centre here, and, if we may judge from present evidence, originated here. The Bromeliaceæ, which have a similar type of foliage, and are partly xerophilous, like the gigantic Puyas of Chili, are mostly epiphytes, inhabiting more humid regions, and only three are recorded from North Mexico.

Another comparison shows that in South Mexico the monocotyledons constitute about 22 per cent. of the flowering plants, and in our three provinces collectively 21·5 per cent., whereas in North Mexico they only amount to a little over 11 per cent.; and taking the petaloid monocotyledons alone the contrast is still more striking. Even assuming that our total for North Mexico is proportionately 150 too low (and there is no reason to suppose the discrepancy is so great), the numbers would be as 1 in North Mexico to 8 in South Mexico.

With regard to extensions into North America, there are a few additional facts. It has been shown (page 223) that the number of Mexican species extending northward west of the Mississippi is almost double that extending northward east of that river. It might be urged that this is just what anybody would have expected and taken for granted, considering the position of the country east of the Mississippi. But this is by no means the matter of course it appears to be, for climatal conditions play the chief part. The number of Mexican and Central-American genera represented respectively in eastern and western North America is as 5 to 6, rather more than less; but many of these genera do not exist in North Mexico. The extensions of North-Mexican genera and species have not been separately tabulated; but from comparisons of certain natural orders it is evident that the extensions into eastern North America are largely, perhaps mainly, South Mexican and not North Mexican. Dr. Asa Gray*, comparing the constituents of the Atlantic and Pacific forests of North America, enumerates the following arboreous genera as absent from the Pacific forests:—*Magnolia*, *Asimina*, *Tilia*, *Robinia*, *Liquidambar*, *Ilex*, *Diospyros*, *Bumelia*, *Ulmus*, *Celtis*, *Morus*, *Ostrya*, *Carpinus*, and *Carya*. Now, all these genera are represented in Mexico, yet, so far as we know, only four out of the fourteen in North Mexico. Furthermore, the species in eastern North America and in the mountains of South Mexico are often identical; thus *Liquidambar styraciflua*, *Ostrya virginica*, and *Carpinus americana* are instances. Whether these elements ever inhabited the intermediate country is beyond the scope of this inquiry, and, one way or the other, would not invalidate data concerning the present condition of things.

Many other facts having the same bearing might be adduced, but ample evidence has been brought forward to prove that North Mexico is the centre of a special xerophilous flora, which, there are good grounds for assuming, originated in this area, though this flora now has considerable northward and southward extensions. The problems concerning preglacial conditions and the successive changes the vegetation may have undergone we shall not attempt to discuss, for it is as true now as it was in 1881 that the geological and phyto-palæontological data are extremely meagre and wholly inadequate for tracing the development of the southern floras *; and we have nothing new to add to the masterly disquisitions on the northern floras by Sir Joseph Hooker, Dr. Asa Gray, Dr. Engler, and other writers. It may be mentioned here, however, that Gray and Hooker recognize two characteristic elements in the North-American flora, namely a boreal-oriental and a Mexican-plateau element. The eastern deciduous trees enumerated above found in South Mexico belong to the first; "and a large part of the botany of California, still more of Nevada, Utah, and Western Texas, and, yet more, that of Arizona and New Mexico, may be regarded as a northward extension of the botany of the Mexican plateau" †.

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* "Forest Geography and Archæology," American Journal of Science and Art, xvi. 1878, p. 183.

Our South-Mexican or central floral province, which also includes Guatemala, Salvador, and Honduras, comprises three elements of unequal development. There is the tropical element, largely consisting of the littoral belt, which is comparatively unimportant, and may be dismissed here, as it will be necessary to define it more fully in the description of the southern floral province. Then there is the xerophilous element of the dry regions of the plateau, which is essentially the same as the characteristic flora of North Mexico and an extension of it; and it has been sufficiently examined and discussed ‡. Finally, there is the distinct preponderating element, which, although we cannot deal with it quite separately so far as mere numbers are concerned, furnishes the prominent features of the whole flora. It seems almost superfluous to repeat here the obvious fact that some of the constituents of contiguous floral regions are the same, and that it is impossible in practice to make definite boundaries. But it is the dominant and characteristic constituents that afford the points of interest in a flora, and it is to these that attention is directed.

As the plants from the different areas of this province are separately tabulated, it is impossible to give the total number of genera and species recorded from the province without entering into fresh calculations, because a large number of both categories are common to two or more of the areas. Therefore it will be more convenient to take the figures for South Mexico and examine them as a sample of the whole flora, premising that the issue will be almost identical. Adding the 'uncertain' Mexican column, as has been done in previous calculations, there is a record of 160 natural orders, 1440 genera, and 7965 species of vascular plants from South Mexico. The

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* See Engler, Versuch, ii. p. 1.

† Bulletin of the United States Geological and Geographical Survey of the Territories, vi. p. 62.

‡ In some parts this element is as strongly developed as in North Mexico; in some regions there is a blending with the other elements, therefore we can only broadly generalize.

absent orders are:—(1) Resedaceæ, (2) Vochysiaceæ, (3) Frankeniaceæ, (4) Elatineæ, (5) Chailletiaceæ, (6) Santalaceæ, and (7) Gnetaceæ. Of these the first is probably not represented in America by any indigenous species; the second and fifth are tropical extensions into Guatemala; and the remaining four, which are known to exist in North Mexico, though very small groups, are widely spread, and may yet be found in South Mexico. Nearly 78 per cent. of the genera known from the three provinces occur in South Mexico, and more than 65 per cent. of the species; and as a more exact investigation is likely to raise rather than lessen these totals, it may safely be inferred that this is one of the densest concentrations of plants in any part of the world where the greater part of the area is within temperate regions. The numbers of orders and genera exceed those for the whole of Australia, and the number of species is within 500 of the total known to inhabit Australia in 1881*.

The orders absolutely or relatively (that is in relation to the whole order) numerous either in genera or species, or both, are:—Polygalaceæ (30 sp.); Malvaceæ (20 gen., 110 sp.); Malpighiaceæ (13 gen., 55 sp.); Burseraceæ (27 sp.); Sapindaceæ (14 gen., 57 sp.); Leguminosæ (84 gen., 564 sp.); Rosaceæ (21 gen., 72 sp.); Crassulaceæ (47 sp.); Melastomaceæ (22 gen., 82 sp.); Lythraceæ (65 sp.); Onagrarieæ (11 gen., 68 sp.); Loasaceæ (5 gen.); Passifloraceæ (39 sp.); Cucurbitaceæ (22 gen., 74 sp.); Begoniaceæ (46 sp.); Cactaceæ (370 sp.); Compositæ (157 gen., 977 sp.); Asclepiadeæ (17 gen., 100 sp.); Gentianaceæ (10 gen., 43 sp.); Polemoniaceæ (5 gen., 14 sp.); Hydrophyllaceæ (4 gen., 18 sp.); Convolvulaceæ (108 sp.); Solanaceæ (18 gen., 162 sp.); Scrophularineæ (33 gen., 104 sp.); Gesneraceæ (12 gen., 49 sp.); Acanthaceæ (29 gen., 110 sp.); Verbenaceæ (16 gen., 69 sp.); Labiatæ (23 gen., 200 sp.); Nyctagineæ (10 gen., 26 sp.); Piperaceæ (136 sp.); Loranthaceæ (42 sp.); Euphorbiaceæ (25 gen., 259 sp.); Urticaceæ (21 gen., 89 sp.); Cupuliferæ (72 sp.); Orchideæ (82 gen., 504 sp.); Bromeliaceæ (64 sp.); Amaryllideæ (12 gen., 128 sp.); Dioscoreæ (20 sp.); Liliaceæ (73 sp.); Palmæ (12 gen., 50 sp.); Aroideæ (45 sp.); Cyperaceæ (170 sp.); Gramineæ (91 gen., 454 sp.); and Filices (42 gen., 379 sp.).

It has already been explained (page 307) how the number of Cactaceæ and other succulent plants attributed to this province may have been augmented at the expense of North Mexico. With these probable exceptions, the foregoing figures are as accurate as could be desired, and betoken an extraordinary richness and plasticity in the flora. Setting aside those characteristic of a dry climate, we find evidence of an enormous development in certain groups of plants which flourish only where there is considerable humidity. These are the plants that inhabit the eastern slopes and ravines, and constitute what we should call the special flora of this province, in contradistinction to the southward extensions of the North-Mexican flora. We rank this as a distinct floral province, and it is perhaps the more convenient and logical course that we could adopt; yet here northern and southern types meet and commingle in a most remarkable manner; and the endemic element is specific rather than generic [*]. The diversified oak-forests laden with epiphytical orchids, Bromeliaceæ, and other plants equally characteristic of the vegetation south of the Isthmus of Panama afford the best illustration of the correctness of this statement. It is true the oak type is not peculiarly characteristic of a moist climate; but it is essentially northern, and although it has reached the Andes of South America, its development there is quite insignificant [†]. On the other hand, the orchids associated with the oaks of Mexico belong almost wholly to genera equally or more strongly represented in South America. Thus only nine out of upwards of a hundred genera are endemic in our central province; and only fourteen are restricted to the country north of the Isthmus of Panama. Further, ten of the fourteen endemic genera are monotypes, and the others number very few species; moreover it is noteworthy that nearly as many of the genera reach eastern as western South America. Details of the distribution of this highly characteristic order in South Mexico will be found on pages 267 to 271, but we do not there distinguish between the eastern and western extensions in South America. From elaborate tables compiled on a slightly different basis from our present, before the publication of the Orchideæ in Bentham and Hooker's 'Genera Plantarum,' it appears that sixty-five of our genera also occur in eastern South America, sixty-nine in western, and fifty-nine in the West Indies; and of species seventy-nine are common to the West Indies, seventy-five to Colombia, twenty-two to Peru, forty-five to Guiana, and thirty-six to Brazil. On the other hand, 520 species of orchids are endemic in the combined areas of South Mexico and Guatemala. The distribution of the Bromeliaceæ, Aroideæ, and Gesneraceæ is very similar; and if other instances of their eastern North-American associates in South Mexico are wanted we may refer to the list of deciduous trees on page 309.

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* Engler, Versuch, ii. p. 34.

The flora of Guatemala is essentially of the same composition as that of South Mexico, though apparently less rich in specific diversity. About 1600 species of vascular plants belonging to 677 genera are recorded from this area. Of the eastern North-American deciduous arboreous types in South Mexico just alluded to, some, as *Tilia* and *Ulmus*, are not known to reach Guatemala, while others, such as *Liquidambar*, *Morus*, *Ostrya*, and *Carpinus*, are present, and the two latter have here their southern limit. As might be expected, too, some characteristic South-American types find their northern limit in Guatemala. Noteworthy among these are the Vochysiaceæ; the genera *Vochysia* and *Trigonia* being both represented.

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[*] The phanerogamic generic endemic element consists of 198 genera for the whole of Mexico and Central America, or 11 per cent. of the total; and the Compositæ, which are represented by very nearly double the number of genera of any other order, and by 5 per cent. more species than the next in numerical sequence, contribute forty-five of them, or 23 per cent., which is nearly twice the proportional amount of the orders collectively, for only 12 per cent. of the total genera belong to the Compositæ. Taking North Mexico alone, the proportional generic endemic element would be even higher in this order, and extending the area to Texas, New Mexico, and Arizona, itwould be enormously increased; and this applies to the generic endemic element generally, confirming the view that this region constitutes a distinct plant province.

[†] Particulars of this will be found at p. 261.

The southern floral province, comprising Nicaragua, Costa Rica, and Panama, exhibits much closer relationships with the South-American tropical flora, and may be of more recent derivation; but the large number of South-American types (see p. 227) which reach Mexico or Guatemala, and not the West Indies, indicate a more remote connection, though of course it may not have been continuous. The vegetation of no part of this province, except perhaps the Panama railway route, has been very thoroughly investigated, yet there are fairly good samples of the flora in herbaria from various parts, including the principal peaks, from the Volcan de Chiriqui to Volcan el Viejo in North-western Nicaragua. Œrsted's Costa-Rica collections, as already mentioned, have only been elaborated in part; but among those published are the Leguminosæ with 90 species; Melastomaceæ, 23; Rubiaceæ, 60; Compositæ, 101; Gesneraceæ, 62; Orchideæ, 198; and Palmæ, 37. Nominally they contain a large percentage of endemic species, which a critical examination of the whole of the materials of the same orders from South America would probably considerably reduce. The low percentage of the endemic generic element in the vegetation of the whole of Mexico and Central America has been commented on (p. 211); and it may be repeated that the southern floral province is by far the poorest of the three provinces; only thirteen, so far as is known, being restricted to it. What the total number of genera of vascular plants recorded for the whole province is we have not ascertained; but there are 497 in Nicaragua, 451 in Costa Rica, and 697 in Panama; and the species are respectively 984, 1140, and 1556. No fewer than 1108 species count as endemic in this province, giving a much higher ratio than in either of the other provinces; yet, as just remarked, we strongly doubt these being the true proportions. Quite a small number of the Panama plants collected by Seemann, the whole of which we have had an opportunity of examining, proved endemic; and the additions thereto by Hayes yielded no greater percentage. The plants from Costa Rica and Nicaragua have only in part been submitted to the same test; but even taking into account the difference in position and the greater development of the mountain chain in Costa Rica, such an enormous accession to the specific endemic element is to be discredited. Indeed in some orders, the Acanthaceæ for example, many of Œrsted's species are clearly spurious.

Of a flora concerning which our knowledge is so imperfect little can be profitably said about the apparent absence of certain types, yet it may be mentioned that *Cheirostemon* is not known to extend into this province, or it would most certainly have been mentioned by travellers; but, what is more inexplicable, there is no record of the existence of any *Fuchsia**. The relationships of the flora, however, may be more correctly appreciated by what is known to be present rather than what is problematically absent. The composition of the Panama flora, so far as investigated by Seemann and Hayes, is so decidedly South American that there is no necessity for insisting upon it, and northward extensions are prominent. Taking some of the mainly tropical orders, such as the Dilleniaceæ and Anonaceæ, we note a gradual thinning out northward, and an extension into the southern province of many South-American species. The essentially eastern South-American Lecythideæ, a suborder of the Myrtaceæ, is represented by four genera and seven species, one of which is common in Nicaragua, the northern limit of these trees. *Podocarpus* replaces *Pinus* in the mountains of Costa Rica, and the Cyclanthaceæ are relatively numerous in the lower regions. Noteworthy examples of southern limits of northern types are offered by *Liquidambar* *, Sabiaceæ, and Juglandeæ in Costa Rica, and *Pinus* in Northern Nicaragua. The oak vegetation of the Volcan de Chiriqui comprises at least three species; and *Arbutus* and *Arctostaphylos* give way to South-American genera of the Vacciniaceæ in the mountains generally. *Chamædorea*, the characteristic genus of palms in the oak-forests of South Mexico, is represented in the southern province by at least half a dozen species, but the majority of the palms belong to genera having their greatest development south of Panama. Many other examples of a change in the vegetation nearly coincident with the northern boundary of Nicaragua might be given, but it seems needless.

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* Since this was written we have seen a specimen of the Guatemalan *Fuchsia bacillaris*, from Costa Rica, collected by Dr. O. Kuntze, and we find that Seemann records *F. microphylla* from Chiriqui (Bot. Voy. 'Herald,' p. 120); but there is no specimen either in the first set of his collection at Kew or in the second set at the British Museum. Assuming this record to be correct, the fact remains that this genus, so numerously represented in South America and Colombia, is rare in the intermediate region. Only one species of *Fuchsia* has been found in the West Indies, and that in St. Domingo; it is *F. triphylla* (see Botanical Magazine, cxi. t. 6795).

An examination of the specimen of the mountain flora (pp. 282–299) brings to light the fact that nearly, if not quite, all the genera there recorded from 8000 feet and upwards in our southern province are such as range from Mexico to the Andes of South America, and some of them wider. As bearing on this question it may be mentioned that the alpine forms of the Andes of South America belong for the greater part to the same genera which inhabit the higher regions of the Andes of Central America and Mexico, though the species are very rarely identical. Engler very fully discusses the relationships † of the vegetation of the upper regions of the mountains of South America and Mexico and the northward and southward migrations that may have taken place. We feel convinced that there has been a northward extension of temperate and alpine forms as well as of tropical, and should regard such genera as *Drimys*, *Fuchsia*, *Colobanthus*, *Calceolaria*, *Roupala*, &c.‡ as of southern origin. There are other genera peculiar to these mountains so equally developed north and south of the Isthmus of Panama that they may have migrated in either direction, always assuming that each type originated in only one place.

Finally, it may be briefly stated that the foregoing attempt to analyze the flora of

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* Inadvertently left out of our distribution tables.

† Versuch, &c. ii. pp. 215–256.

‡ For further particulars on this subject see Botany of the 'Challenger' Expedition, i., Introduction, pp. 52–65.

Mexico and Central America and trace its development and the directions of its migrations in recent times brings us to the conclusion that there are three sufficiently marked aggregations of plants to justify their being treated as so many distinct floral provinces, namely a northern, a central, and a southern; but they are not all of the same value, and the available data are inadequate to define them with exactitude.

The northern province is the focus of a xerophilous flora extending into the dry regions of South Mexico and into the territories north of Mexico.

The central province, disregarding the purely tropical and the xerophilous overlappings, is a mingling of northern and southern types which exhibit an extraordinarily rich production of local species, associated with about 12 per cent. of indigenous genera. The alpine flowering plants belong to genera of several categories, namely: such as are of wide distribution (and this is the largest); such as are peculiar to America, but do not extend south of Panama; such as are peculiar to America and find their northern limit in Mexico; such as are peculiar to America and extend both north and south of our limits; together with a very small percentage of quite local genera.

The southern province is an outlying portion of the American tropical flora, and in composition is almost limited to specific differentiations. The tropical element in our whole flora is more closely allied to that of eastern South America even than it is to that of the West Indies, and includes types of the former which are not known to reach the West Indies.

Alston's table of the distribution of the Central-American and Mexican mammals *, though necessarily drawn up on different lines, presents strikingly similar laws of distribution, especially when the possible and probable diverse means and agencies of dispersal of animals and plants are taken into consideration †. Thus there is a very small generic endemic element; a large specific endemic element; the northern and southern extensions are in much the same proportions; and the country is the centre of the families Procyonidæ and Geomyidæ. Further, with regard to the boundary between our central and southern provinces, Salvin points out ‡ that there is a very decided change in the avifauna proceeding from Nicaragua to Guatemala; and it was upon his suggestion that it was adopted as the boundary in this work.

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* Biologia Centrali-Americana. Mammalia: Introduction.

† It has not been thought desirable to enter in this essay into particulars and speculations on the means whereby plants have been, or may have been, dispersed, as the trustworthy data have been more than exhausted by various writers; and additional careful observations are necessary to carry us further.

‡ 'The Ibis,' 1872, p. 312.

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INDEX.

[Names in capitals refer to tribes &c.; those in small capitals to genera; those in roman type to the chief reference to the species included in the work; those in italics to species incidentally mentioned, synonyms, &c.]

ABASOLIA, ii. 159.
Abasolia taboada, ii. 159.
ABELIA, ii. 4.
Abelia, iv. 170, 212, 222, 229, 248.
Abelia coriacea, ii. 4.
—— floribunda, ii. 5.
—— *floribunda*, iv. 287.
—— *hirsuta*, ii. 5.
—— speciosa, ii. 5; iv. 287.
ABIES, iii. 190.
Abies, iv. 265.
—— *amabilis*, iv. 89.
—— *douglasii*, iii. 190.
—— *glaucescens*, iii. 190.
—— *hirtella*, iii. 190.
—— religiosa, iii. 190.
—— *religiosa*, iv. 89, 149, 150, 265, 266, 294.
—— *tlapalcatudo*, iii. 190.
ABIETINEÆ, iii. 186.
Abildgaardia monostachya, iii. 459.
—— *pubescens*, iii. 460.
ABOBREÆ, i. 486.
ABRONIA, iii. 7.
Abronia cycloptera, iii. 7.
—— fragrans, iii. 7.
—— *mellifera*, iii. 7; iv. 141.
—— *micrantha*, iii. 7.
—— turbinata, iii. 7.
ABUTILON, i. 108.
Abutilon, i. 113; iv. 213.
Abutilon albidum, i. 108.
—— *ambiguum*, i. 105.
—— amplexifolium, i. 108.
—— andrieuxii, i. 109.
—— asiaticum, i. 109.
—— blandum, i. 109.
—— crispum, i. 109.
—— cymosum, i. 109.
—— divaricatum, i. 110.
—— elatum, i. 110.
Abutilon erosum, i. 110.
—— floribundum, i. 110.
—— giganteum, i. 110.
—— graveolens, i. 110.
—— hænkeanum, i. 110.
—— *hirtum*, i. 110.
—— holosericeum, iv. 14.
—— hypoleucum, i. 110.
—— integerrimum, i. 110.
—— *leiospermum*, i. 107.
—— lemmoni, iv. 14.
—— macranthum, i. 110.
—— mexicanum, i. 110.
—— notolophium, i. 110.
—— *nudiflorum*, i. 108.
—— palmeri, i. 110.
—— *periplocifolium*, i. 108.
—— racemosum, i. 110.
—— ramosissimum, i. 111.
—— rufescens, i. 111.
—— *rufinerve*, i. 109.
—— sessilifolium, i. 111.
—— sidoides, i. 111.
—— sonoræ, i. 111.
—— *spicatum*, i. 108.
—— *striatum*, i. 112.
—— texense, i. 111.
—— thurberi, i. 111.
—— trilobatum, i. 111.
—— triquetrum, i. 112.
—— *velutinum*, iv. 14.
—— venosum, i. 112.
—— wrightii, i. 112.
ACACIA, i. 352.
Acacia, i. 527; iv. 146, 164, 212, 213, 233, 240.
—— *acapulcensis*, i. 356.
—— acatlensis, i. 352.
—— *adenantheroides*, i. 346.
—— *albicans*, i. 359.
—— *albida*, i. 355.
Acacia amentacea, i. 352.
—— *angulosa*, i. 353.
—— *aurita*, i. 356.
—— berlandieri, i. 352.
—— *callistemon*, i. 357.
—— *canescens*, i. 347.
—— *carbonaria*, i. 355.
—— *chlorantha*, i. 353.
—— constricta, i. 352.
—— coulteri, i. 352.
—— crassifolia, i. 352; iv. 33.
—— *cumingii*, i. 355.
—— *cuspidata*, i. 353.
—— cylindriflora, i. 352.
—— *desmostachys*, i. 356.
—— *diversifolia*, i. 351.
—— *elegans*, i. 353.
—— *esculenta*, i. 351.
—— farnesiana, i. 352; iv. 99, 112.
—— *farnesiana*, iv. 144.
—— *fasciculata*, i. 347.
—— ferox, i. 353.
—— filicina, i. 353.
—— flexicaulis, i. 353.
—— *fœtida*, i. 343.
—— *formosa*, i. 357.
—— *glabrata*, i. 353.
—— glomerosa, i. 353.
—— *gracilis*, i. 357.
—— greggii, i. 353.
—— *hartwegii*, i. 353.
—— hayesii, i. 353.
—— hindsii, i. 353.
—— *hirsuta*, i. 353.
—— *hirta*, i. 348.
—— *humilis*, i. 358.
—— *insignis*, i. 353.
—— *lambertiana*, i. 358.
—— lanata, i. 354.
—— macracantha, i. 354.
—— *macracanthoides*, i. 354.

Acacia malacophylla, i. 354.
—— mammifera, i. 354.
—— melanoceras, i. 354.
—— *metrosideriflora*, i. 358.
—— micrantha, i. 354.
—— mollicula, i. 354.
—— *obliquifolia*, i. 359.
—— palmeri, iv. 33.
—— parviflora, i. 353.
—— pennatula, i. 354.
—— platyacantha, i. 354.
—— *prosopoides*, i. 343.
—— pubescens, i. 354.
—— *pulverulenta*, i. 351.
—— reniformis, i. 354.
—— *rigidula*, i. 352.
—— riparia, i. 354.
—— rœmeriana, i. 355.
—— rotundata, i. 355.
—— *rubescens*, i. 358.
—— schottii, i. 355.
—— *sericea*, i. 352.
—— spadicigera, i. 355; iv. 99.
—— sphærocephala, i. 355.
—— *stipellata*, i. 353.
—— *subinermis*, i. 354.
—— *tephroloba*, i. 352.
—— *texensis*, i. 353.
—— tortuosa, i. 355.
—— *tortuosa*, iv. 233.
—— *trichandra*, i. 351.
—— *umbellulifera*, i. 353.
—— villosa, i. 355.
—— wrightii, i. 355.
ACACIEÆ, i. 352.
ACÆNA, i. 378.
Acæna, iv. 234.
Acæna agrimonioides, i. 378.
—— *agrimonioides*, iv. 285.
—— elongata, i. 378.
—— *elongata*, iv. 149, 150, 285.
—— lævigata, i. 378.
—— lappacea, i. 378.
ACALYPHA, iii. 122.
Acalypha, iv. 213, 260.
Acalypha adenostachya, iii. 122.
—— *agrimonioides*, iii. 122.
—— alopecuroides, iii. 122; iv. 114.
—— anemioides, iii. 122; iv. 86.
—— arvensis, iii. 122.
—— brachyclada, iii. 123.
—— brevicaulis, iii. 123.
—— *billbergiana*, iii. 123.
—— botteriana, iii. 122.
—— carpinifolia, iii. 124.
Acalypha cincta, iii. 123.
—— chamædrifolia, iii. 123.
—— conspicua, iii. 123.
—— cuspidata, iii. 123.
—— depauperata, iii. 123.
—— deppeana, iii. 128.
—— diversifolia, iii. 123.
—— *diversifolia*, iv. 114.
—— eglandulosa, iii. 122, 127.
—— *filiformis*, iii. 128.
—— firmula, iii. 124.
—— fournieri, iii. 124.
—— frederici, iii. 124.
—— genuina, iii. 122, 123, 124, 127, 128, 129.
—— geraniifolia, iii. 127.
—— glabrescens, iii. 125.
—— glandulosa, iii. 124, 129.
—— hederacea, iii. 124.
—— hirta, iii. 127.
—— intermedia, iii. 129.
—— *interrupta*, iii. 121.
—— karwinskii, iii. 124.
—— lagascana, iii. 124.
—— langiana, iii. 124.
—— laxiflora, iii. 124.
—— leptoclada, iii. 125.
—— leptopoda, iii. 125.
—— leptostachya, iii. 123.
—— *leptostachya*, *α. popayanensis*, iii. 123.
—— ——, *β. genuina*, iii. 123.
—— liebmanniana, iii. 125.
—— lindeniana, iii. 125.
—— lindheimeri, iii. 125; iv. 86.
—— *linostachys*, iii. 129.
—— longespicata, iii. 125.
—— longestipularis, iii. 125.
—— macradonta, iii. 128.
—— macrostachya, iii. 125.
—— macrostachyoides, iii. 125.
—— melochiæfolia, iii. 126.
—— mexicana, iii. 126.
—— microcephala, iii. 126.
—— *microphylla*, iii. 123.
—— *microstachya*, iii. 126.
—— mollis, iii. 125, 126, 128.
—— *monostachya*, iii. 122.
—— monostachya, iii. 126.
—— neomexicana, iv. 87.
—— obscura, iii. 126.
—— ocymoides, iii. 126.
—— oligantha, iii. 126.
—— oligodonta, iii. 124, 126.
—— orbicularis, iii. 124.
—— *padifolia*, iii. 126, 128.
Acalypha panamensis, iii. 123.
—— parvifolia, iii. 126.
—— *pastoris*, iii. 127.
—— pavoniana, iii. 122.
—— persimilis, iii. 127.
—— *phleoides*, iii. 125; iv. 86.
—— phleoides, iii. 127.
—— pilosa, iii. 127.
—— polystachya, iii. 127.
—— popayanensis, iii. 123.
—— *prunifolia*, iii. 127.
—— pubescens, iii. 122.
—— purpurascens, iii. 127.
—— radians, iii. 127.
—— *reptans*, iii. 123.
—— ——, *α. genuina*, iii. 123.
—— rhombifolia, iii. 127.
—— *rubra*, iii. 127.
—— schiedeana, iii. 128.
—— schlechtendaliana, iii. 128.
—— schlumbergeri, iii. 128.
—— *seemanni*, iii. 125.
—— septemloba, iii. 128.
—— setosa, iii. 128.
—— sidæfolia, iii. 125.
—— subtomentosa, iii. 128.
—— tomentosa, iii. 129.
—— trachyloba, iii. 128.
—— tricholoba, iii. 128.
—— triloba, iii. 128.
—— unibracteata, iii. 129.
—— vagans, iii. 129.
—— villosa, iii. 129.
—— virginica, iii. 129.
ACANTHACEÆ, ii. 500; iv. 79, 106.
Acanthaceæ, iv. 189, 202, 215, 217, 225, 231, 233, 258.
ACANTHOCHITON, iii. 14.
Acanthochiton wrightii, iii. 14.
Acanthonychia ramosissima, iii. 10.
ACANTHORRHIZA, iii. 411.
Acanthorrhiza, iv. 152.
Acanthorrhiza aculeata, iii. 411.
—— mocinni, iii. 411.
—— warscewiczii, iii. 411.
ACANTHOSPERMUM, ii. 147.
Acanthospermum hispidum, ii. 147.
—— humile, ii. 147.
ACER, i. 214.
Acer grandidentatum, iv. 24.
—— mexicanum, i. 214.
ACERATES, ii. 321.
Acerates asperula, ii. 321.
—— *asperula*, iv. 68.
—— circinalis, iii. 322.

Acerates circinalis, iv. 68.
—— *decumbens*, ii. 321.
—— gomphocarpoides, ii. 322.
—— *gomphocarpoides*, ii. 336; iv. 68.
—— humilis, ii. 322.
—— *paniculata*, ii. 321.
—— schaffneri, iv. 68.
—— vinosa, iv. 68.
—— viridiflora, iv. 68.
ACEREÆ, i. 214.
ACHÆTA, iii. 553.
Achæta geniculata, iii. 553.
—— plumosa, iii. 553.
—— *plumosa*, iv. 297.
ACHÆTOGERON, ii. 119.
Achætogeron galeotti, ii. 119.
—— seemannii, ii. 120.
—— wislizeni, ii. 120.
Achania mollis, i. 119.
ACHATOCARPUS, iii. 12.
Achatocarpus nigricans, iii. 12.
ACHILLEA, ii. 229.
Achillea millefolium, ii. 229.
—— *millefolium*, iv. 149, 288.
ACHIMENES, ii. 473.
Achimenes, iv. 299.
—— *amabilis*, ii. 476.
—— amœna, ii. 473.
—— andrieuxii, ii. 473.
—— *argyrostigma*, ii. 477.
—— *atrosanguinea*, ii. 474.
—— autumnalis, ii. 473.
—— *candida*, ii. 477.
—— cardinalis, iv. 79.
—— coccinea, ii. 473.
—— *coccinea*, var. *rosea*, ii. 473.
—— *cordata*, ii. 474.
—— *cupreata*, ii. 482.
—— foliosa, ii. 474.
—— *foliosa*, iv. 292.
—— *ghiesbrechtiana*, ii. 474.
—— *ghiesbrechtii*, ii. 474.
—— *gloxiniflora*, ii. 473.
—— *gracilis*, ii. 477.
—— grandiflora, ii. 474.
—— *grandiflora*, iv. 300.
—— heterophylla, ii. 474.
—— hirsuta, ii. 474.
—— *ignescens*, ii. 474.
—— incisa, ii. 474.
—— *kleei*, ii. 475.
—— lanata, ii. 475.
—— *lanata*, iv. 292.
—— longiflora, ii. 475.
—— *martensiana*, ii. 474.
—— *misera*, ii. 477.
Achimenes panamensis, ii. 475.
—— patens, ii. 475.
—— pauciflora, ii. 475.
—— pedunculata, ii. 475.
—— *pyropæa*, ii. 474.
—— rosea, ii. 475.
—— scheerii, ii. 476.
—— *scheerii*, iv. 257.
—— *skinneri*, ii. 474.
—— tenella, ii. 476.
ACHLAMYDOSPOREÆ, iii. 80.
ACHRAS, ii. 297.
Achras sapota, ii. 297.
ACHYRANTHES, iii. 15.
Achyranthes altissima, iii. 13.
—— aspera, iii. 15.
—— *polygonoides*, iii. 16.
ACHYROCLINE, ii. 135.
Achyrocline, iv. 231.
Achyrocline ventosa, ii. 135.
ACHYRONYCHIA, iii. 10.
Achyronychia palmeri, iii. 10.
—— parryi, iii. 10.
Achyropappus anthemoides, ii. 212.
—— *pedatus*, ii. 214.
—— *schkuhrioides*, ii. 212.
Achyrophorus roseus, ii. 262.
ACINETA, iii. 259.
Acineta barkeri, iii. 259.
—— chrysantha, iii. 259.
—— cryptodonta, iii. 259.
—— densa, iii. 260.
—— *fulva*, iii. 260.
—— humboldtii, iii. 260.
—— *schilleriana*, iii. 260.
—— sella-turcica, iii. 260.
—— *sella-turcica*, iv. 295.
—— *superba*, iii. 260.
—— *warscewiczii*, iii. 260.
ACIOTIS, i. 419.
Aciotis purpurascens, i. 419.
—— rostellata, i. 419.
—— rubricaulis, i. 419.
Aciphyllæa acerosa, ii. 220.
ACISANTHERA, i. 416.
Acisanthera quadrata, i. 416.
—— recurva, i. 416.
ACLEISANTHES, iii. 6.
Acleisanthes, iv. 140.
Acleisanthes anisophylla, iii. 6.
—— berlandieri, iii. 6.
—— longiflora, iii. 6.
—— wrightii, iii. 6.
Acmella hirta, ii. 157.
ACNISTUS, ii. 424.
Acnistus arborescens, ii. 424.
—— benthami, ii. 424.
Acoidium fuscum, iii. 271.
Aconiopteris longifolia, iii. 686.
Acontias cubensis, iii. 419.
—— *helleborifolius*, iii. 418.
—— *hoffmannii*, iii. 418.
—— *wendlandii*, iii. 418.
Acourtia formosa, ii. 256, 257.
—— *hebeclada*, ii. 256.
—— *macrocephala*, ii. 257.
—— *moschata*, ii. 256.
—— *rigida*, ii. 257.
—— *seemannii*, ii. 257.
—— *turbinata*, ii. 257; iv. 65.
Acrilla sloanei, iv. 98.
Acrocarpidium hispidulum, iii. 61.
—— *mexicanum*, iii. 62.
—— *nummularifolium*, iii. 63.
—— *pulicare*, iii. 65.
—— *repens*, iii. 65.
—— *rotundifolium*, iii. 59.
ACROCOMIA, iii. 414.
Acrocomia, iv. 146, 152, 155, 276.
—— *aculeata*, iv. 146.
—— mexicana, iii. 414.
—— sclerocarpa, iii. 414.
—— vinifera, iii. 414.
Acropera, iv. 304.
—— *armeniaca*, iii. 255.
—— *batemani*, iii. 255.
—— *cornuta*, iii. 255.
—— *flavida*, iii. 255.
—— *loddigesii*, iii. 255.
ACROSTICHEÆ, iii. 683.
ACROSTICHUM, iii. 683.
Acrostichum, iv. 148, 149, 213.
—— *affine*, iii. 684, 685.
—— alienum, iii. 683.
—— *alismæfolium*, iii. 686.
—— *andicola*, iii. 686.
—— *attenuatum*, iii. 687.
—— aureum, iii. 683; iv. 161, 165.
—— auricomum, iii. 684.
—— bellermannianum, iii. 684; iv. 116.
—— *blepharodes*, iii. 684, 685, 687.
—— *bourgæanum*, iii. 686.
—— *callolepis*, iii. 686.
—— caudatum, iii. 684.
—— *cayennense*, iii. 683.
—— cervinum, iii. 684.
—— *ciliatum*, iii. 688.
—— cœnopteris, iii. 684.
—— conforme, iii. 684.
—— *crassifolium*, iii. 683.
—— crinitum, iii. 685.
—— *crinitum*, iii. 685, 687.
—— *danææfolium*, iii. 683.

Acrostichum durvillei, iii. 683.
—— *elegans*, iii. 692.
—— *elongatum*, iii. 690, 691.
—— *erinaceum*, iii. 689.
—— *flaccidum*, iii. 685, 688.
—— flaccidum, iv. 116.
—— *formosum*, iii. 683.
—— *fraxinifolium*, iii. 683.
—— *fulvum*, iii. 686.
—— *gayanum*, iii. 687.
—— glaucum, iii. 685.
—— gratum, iii. 685.
—— guatemalense, iii. 685.
—— *hartwegii*, iii. 687.
—— *hastatum*, iii. 683.
—— *hirtum*, iii. 690.
—— *humile*, iii. 690.
—— hybridum, iii. 685; iv. 116.
—— *hybridum*, iii. 685, 689.
—— *inæquale*, iii. 683.
—— *impressum*, iii. 686.
—— *intermedium*, iii. 690.
—— *irregulare*, iii. 683.
—— *jamesoni*, iii. 689.
—— *laminarioides*, iii. 684.
—— ——, *a. longipes*, iii. 684.
—— latifolium, iii. 686.
—— *lepidopteris*, iii. 662.
—— lepidotum, iii. 686.
—— *lepidotum*, iii. 687; iv. 298.
—— *leptophyllum*, iii. 687.
—— *liebmannii*, iii. 686.
—— lindeni, iii. 686.
—— *lindeni*, iii. 687; iv. 298.
—— lineare, iii. 687.
—— *lingua*, iii. 686, 689.
—— lingua, iv. 116.
—— lonchophyllum, iii. 687.
—— *longifolium*, iii. 684, 686.
—— *marginatum*, iii. 683.
—— *mathewsii*, iv. 298.
—— matthewsii, iii. 687.
—— melanopus, iii. 687.
—— *mexicanum*, iii. 685.
—— muelleri, iii. 687.
—— *muscosum*, iii. 687.
—— *nanum*, iii. 687.
—— *nitidum*, iii. 689.
—— nudum, iii. 687.
—— *obliquum*, iii. 683.
—— obscurum, iii. 688.
—— *ovatum*, iii. 690.
—— peltatum, iii. 688.
—— *piloselloides*, iii. 689.
—— pilosum, iii. 688.
—— *preslianum*, iii. 688.
—— *pumilum*, iii. 686, 689.
Acrostichum recognitum, iii. 688.
—— *revolutum*, iii. 690.
—— *rigens*, iii. 683.
—— *roezlii*, iii. 686.
—— *rubiginosum*, iii. 690.
—— *rufescens*, iii. 686.
—— salvini, iii. 688.
—— *sartorii*, iii. 686.
—— *scandens*, iii. 689.
—— *scapellum*, iii. 686.
—— *schaffneri*, iii. 684.
—— *schiedei*, iii. 690, 691.
—— *schmitzii*, iii. 690, 691.
—— scolopendrifolium, iii. 689.
—— *sculpturatum*, iii. 683.
—— serratifolium, iii. 689.
—— *setosum*, iii. 688.
—— siloense, iii. 687.
—— simplex, iii. 689.
—— *simplex*, iii. 686, 687, 688; iv. 298.
—— sorbifolium, iii. 689.
—— spathulatum, iii. 689; iv. 116.
—— *speciosum*, iii. 683.
—— *squamatum*, iii. 686.
—— squamipes, iii. 690.
—— *squamipes*, iv. 298.
—— *squamosum*, iii. 686.
—— squamosum, iii. 690.
—— squarrosum, iii. 690.
—— tambillense, iii. 690.
—— tatei, iii. 690.
—— tectum, iii. 690.
—— *tectum*, iv. 298.
—— *tenuifolium*, iii. 687.
—— *umbrosum*, iii. 683.
—— *unitum*, iii. 684.
—— *venustum*, iii. 686, 690.
—— *vestitum*, iii. 686.
—— villosum, iii. 691.
—— viride, iii. 691.
—— *viscosum*, iii. 688.
—— viscosum, iii. 691; iv. 116.
Actinea chrysanthemoides, ii. 229.
—— *integrifolia*, ii. 227.
ACTINELLA, ii. 228.
Actinella cooperi, iv. 63.
—— insignis, iv. 63.
—— linearifolia, iv. 63.
—— palmeri, iv. 63.
—— scaposa, ii. 228; iv. 63.
Actiniopteris, iii. 629.
Actinochloa gracilis, iii. 562.
—— *hirsuta*, iii. 562.
—— *humilis*, iii. 563.
—— *ovata*, iii. 561.
—— *prostrata*, iii. 563.
Actinochloa scorpioides, iii. 563.
—— *tenuis*, iii. 563.
Actinocyclus secundus, ii. 283.
ACTINOMERIS, ii. 185; iv. 57.
Actinomeris, iv. 58.
Actinomeris longifolia, ii. 185.
—— ovata, ii. 185.
—— *pedunculosa*, ii. 187.
—— stricta, ii. 186.
—— tetragona, ii. 186.
—— tetraptera, ii. 186.
—— wrightii, ii. 186.
ADELIA, iii. 129.
Adelia barbinervis, iii. 129.
—— *dodecandra*, iii. 121.
—— oaxacana, iii. 129.
—— triloba, iii. 130.
ADELOBOTRYS, i. 421.
Adelobotrys adscendens, i. 421.
ADENANTHEREÆ, i. 343.
ADENARIA, i. 436.
Adenaria lanceolata, i. 436.
—— purpurata, i. 436.
Adenodiscus mexicanus, i. 136.
ADENOPAPPUS, ii. 221.
Adenopappus persicæfolius, ii. 221.
Adenopetalum boerhaaviifolium, iii. 91.
—— *bracteatum*, iii. 100.
—— *discolor*, iii. 93.
—— *ellipticum*, iii. 95, 100.
—— *gramineum*, iii. 95.
—— *hoffmannii*, iii. 95.
—— *irazuense*, iii. 95.
—— *mexicanum*, iii. 95.
—— *œrstedii*, iii. 95.
—— *pubescens*, iii. 95.
—— *subsinuatum*, iii. 95.
ADENOPHYLLUM, ii. 218.
Adenophyllum capillaceum, ii. 218.
—— coccineum, ii. 218.
—— porophyllum, ii. 218.
—— wrightii, ii. 218.
Adenoropium elegans, iii. 107.
—— *gossypiifolium*, iii. 107.
ADENOSTEMMA, ii. 79.
Adenostemma, iv. 252.
Adenostemma hirtiflorum, ii. 79.
Adhatoda candicans, ii. 517.
—— *carthaginensis*, ii. 517.
—— *dipteracantha*, ii. 516.
—— *furcata*, ii. 515.
—— *longiflora*, ii. 516.
—— *pacifica*, ii. 515.
—— *sericea*, ii. 521.
Adiantopsis radiata, iii. 616.
ADIANTUM, iii. 607.

Adiantum, iv. 149, 213.
—— *acuminatum*, iii. 612.
—— æthiopicum, iii. 607.
—— *affine*, iii. 607.
—— *amabile*, iii. 609.
—— *amplum*, iii. 609.
—— *andicolum*, iii. 609.
—— *brasiliense*, iii. 608.
—— braunii, iii. 607.
—— capillus-veneris, iii. 607; iv. 148.
—— *capillus-veneris*, iv. 297.
—— *chilense*, iii. 611.
—— ——, *β. pilosulum*, iii. 611.
—— concinnum, iii. 607, 611.
—— convolutum, iii. 608.
—— cooperi, iv. 115.
—— *crenatum*, var. *glabrescens*, iii. 607.
—— cristatum, iii. 608.
—— *cuneatum*, iii. 609.
—— curvatum, iii. 608.
—— *dolabriforme*, iii. 610.
—— dolosum, iii. 608.
—— excisum, iii. 608.
—— *extensum*, iii. 609.
—— *falcatum*, iii. 612.
—— feei, iii. 608.
—— *filiforme*, iii. 610.
—— *flexuosum*, iii. 608.
—— *fragile*, iii. 611.
—— *fructuosum*, iii. 611.
—— galeottianum, iii. 608.
—— glaucophyllum, iii. 609; iv. 297.
—— *gratum*, iii. 607.
—— hirtum, iii. 609.
—— *incisum*, iii. 609.
—— intermedium, iii. 609.
—— kaulfussii, iii. 609.
—— *lobatum*, iii. 607.
—— lucidum, iii. 609.
—— ——, *α. pinnatum*, iii. 609.
—— ——, var. *β. pinnatum*, iii. 609.
—— *lunatum*, iii. 610.
—— lunulatum, iii. 610.
—— *lutescens*, iii. 607.
—— macrophyllum, iii. 610.
—— *mexicanum*, iii. 609.
—— *multiforme*, iii. 609.
—— *oblique-truncatum*, iii. 612.
—— obliquum, iii. 610.
—— patens, iii. 610; iv. 115.
—— *pellucidum*, iii. 607.
—— *pentadactylon*, iii. 612.
—— pilosum, iii. 610.
Adiantum prionophyllum, iii. 611.
—— pulverulentum, iii. 610.
—— *radiatum*, iii. 616.
—— scabrum, iii. 611.
—— schaffneri, iii. 611.
—— seemanni, iii. 611.
—— shepherdi, iii. 611.
—— *striatum*, iii. 608.
—— *tenerum*, iii. 607, 611; iv. 115.
—— ——, var. *dissectum*, iii. 607.
—— tetraphyllum, iii. 611.
—— ——, *γ. obtusum*, iii. 608.
—— *thalictroides*, iii. 607.
—— trapeziforme, iii. 607, 612; iv. 114.
—— *trapezoides*, iii. 611.
—— *triangulatum*, iii. 609.
—— *tricholepis*, iii. 611.
—— *villosum*, iii. 611; iv. 300.
—— villosum, iii. 612.
—— *wilsoni*, iii. 608.
ADOLPHIA, i. 201.
Adolphia infesta, i. 201; iv. 22.
—— *infesta*, iv. 140.
ÆCHMEA, iii. 314.
Æchmea chiriquensis, iv. 90.
—— dactylina, iii. 314.
—— laxiflora, iii. 314.
—— *laxiflora*, iii. 315.
—— mariæ-reginæ, iii. 314.
—— mexicana, iii. 314.
—— pubescens, iii. 314.
—— schiedeana, iii. 315.
—— spectabilis, iii. 315.
—— vriesioides, iii. 315.
Æginetia longiflora, ii. 30.
ÆGIPHILA, ii. 538.
Ægiphila arborescens, ii. 538.
—— brachiata, ii. 538.
—— *deppeana*, ii. 538.
Ægopodium, iv. 149.
ÆGOPOGON, iii. 516.
Ægopogon cenchroides, iii. 517.
—— *cenchroides genuinus*, iii. 516.
—— geminiflorus, iii. 517.
—— *multisetus*, iii. 516, 517.
—— *quinquesetus*, iii. 516, 517.
—— *setifer*, iii. 517.
—— *trisetus*, iii. 516, 517.
—— *unisetus*, iii. 517.
Aeranthus schiedei, iii. 292.
ÆSCHYNOMENE, i. 270.
Æschynomene americana, i. 270.
—— brasiliana, i. 270.
—— *ciliata*, i. 271.
—— conferta, i. 271.
—— elegans, i. 271.
Æschynomene falcata, i. 271.
—— fascicularis, i. 271.
—— floribunda, i. 271.
—— glandulosa, i. 271.
—— *gracilis*, i. 271.
—— hedysaroides, i. 271.
—— hirsuta, i. 271.
—— hispida, i. 271.
—— hispidula, i. 271.
—— hystrix, i. 271.
—— lævis, i. 272.
—— *longifolia*, i. 263; iv. 27.
—— paniculata, i. 272.
—— *paucijuga*, i. 270.
—— *picta*, i. 263.
—— *podocarpa*, i. 271.
—— sensitiva, i. 272.
—— *sensitiva*, iv. 230.
—— *tecta*, i. 271.
—— *virgata*, i. 261.
—— viscidula, i. 272.
ÆSCULUS, i. 212.
Æsculus, iv. 146.
Æsculus mexicana, i. 212; iv. 23.
Agallostachys, iii. 313.
—— *pinguin*, iii. 313.
AGANIPPEA, ii. 156.
Aganippea bellidiflora, ii. 157.
—— dentata, ii. 157.
Agassizia suavis, iv. 63.
AGAVE, iii. 338.
Agave, iv. 127, 140, 142, 148, 149, 155, 167, 212, 214, 272, 273, 274, 299, 307, 309.
Agave albicans, iii. 339.
—— *alvina*, iii. 349.
—— americana, iii. 339.
—— *americana*, iii. 338; iv. 167, 264, 273.
—— *amœna*, iii. 349.
—— *amurensis*, iii. 344.
—— *angustifolia*, iii. 348.
—— angustissima, iii. 339.
—— applanata, iii. 339.
—— asperrima, iii. 339.
—— atrovirens, iii. 339.
—— attenuata, iii. 339.
—— *beaucarnei*, iii. 344.
—— *beauleriana*, iii. 346.
—— bernhardi, iii. 340.
—— *besseriana*, iii. 345.
—— botterii, iii. 340.
—— bouchei, iii. 340.
—— brachystachys, iii. 340.
—— bracteosa, iii. 340.
—— brauniana, iii. 340.
—— bromeliæfolia, iii. 340.

Agave bulbifera, iii. 340.
—— cærulescens, iii. 345.
—— *cæspitosa*, iii. 349.
—— *californica*, iii. 342.
—— canartiana, iii. 340.
—— *cantula*, iii. 351.
—— *celsiana*, iii. 340.
—— celsii, iii. 340.
—— chiapensis, iii. 340.
—— *chiapensis*, iii. 347.
—— chloracantha, iii. 341.
—— cinerascens, iii. 341.
—— coarctata, iii. 341.
—— coccinea, iii. 341.
—— cochlearis, iii. 341.
—— *cohniana*, iii. 352.
—— *concinna*, iii. 339.
—— concinna, iii. 341.
—— conduplicata, iii. 341.
—— *consideranti*, iii. 351.
—— *cucullata*, iii. 349.
—— *cyanophylla*, iii. 346.
—— dasylirioides, iii. 341.
—— *dealbata*, iii. 341.
—— *debaryana*, iii. 347.
—— decaisneana, iii. 341.
—— deflexispina, iii. 341.
—— demeesteriana, iii. 341.
—— densiflora, iii. 341.
—— *desmettiana*, iii. 346.
—— ehrenbergiana, iii. 341.
—— *ehrenbergii*, iii. 344.
—— elemeetiana, iii. 342.
—— *elongata*, iii. 348.
—— ensifera, iii. 342.
—— excelsa, iii. 342.
—— *expansa*, iii. 339.
—— falcata, iii. 342.
—— fenzliana, iii. 342.
—— ferox, iii. 342.
—— filamentosa, iii. 342.
—— filifera, iii. 342.
—— ——, var. *adornata*, iii. 349.
—— ——, var. *pannosa*, iii. 349.
—— flaccida, iii. 342.
—— *flavescens*, iii. 345.
—— *fœtida*, iii. 353.
—— *fourcroyoides*, iii. 348.
—— *fuerstenbergii*, iii. 339.
—— galeotti, iii. 343.
—— geminiflora, iii. 343.
—— *geminiflora?*, var. *sonoræ*, iii. 349.
—— ghiesbreghtii, iii. 343.
—— *glaucescens*, iii. 339.
—— gœppertiana, iii. 343.
—— gracilis, iii. 343.
Agave guttata, iii. 343.
—— haseloffi, iii. 343.
—— heteracantha, iii. 343.
—— hookeri, iii. 343.
—— *hookeri*, iii. 342, 344.
—— horizontalis, iii. 344.
—— horrida, iii. 344.
—— houlletii, iii. 344.
—— humboldtiana, iii. 344.
—— *humilis*, iii. 340.
—— inæquidens, iii. 344.
—— *ixtli*, iii. 348.
—— *ixtlioides*, iii. 348.
—— jacobiana, iii. 344.
—— jacquiniana, iii. 345.
—— *karwinskii*, iii. 348.
—— *kellocki*, iii. 347.
—— *keratto*, iii. 346, 348.
—— kerchovei, iii. 344.
—— kewensis, iii. 344.
—— kochii, iii. 344.
—— *lamprochlora*, iii. 350.
—— laurentiana, iii. 344.
—— *lecheguilla*, iii. 343.
—— *lechuguilla*, iii. 343.
—— legrelliana, iii. 344.
—— lehmanni, iii. 345.
—— lindleyi, iii. 345.
—— *linearis*, iii. 345.
—— lophanta, iii. 345.
—— lurida, iii. 345.
—— macroacantha, iii. 345.
—— maculata, iii. 345.
—— *maculosa*, iii. 345.
—— *magui*, iii. 346.
—— maigretiana, iii. 345.
—— martiana, iii. 346.
—— maximiliana, iii. 346.
—— megalacantha, iii. 346.
—— melanacantha, iii. 346.
—— mexicana, iii. 346.
—— micrantha, iii. 346.
—— ——, β. *albidior*, iii. 339.
—— *milleri*, iii. 339.
—— miradorensis, iii. 346.
—— mitis, iii. 346.
—— mitræformis, iii. 346.
—— muilmanni, iii. 346.
—— nissoni, iii. 347.
—— *noackii*, iii. 349.
—— *oblongata*, iii. 346.
—— *ornata*, iii. 339.
—— ottonis, iii. 347.
—— *ousselghemiana*, iii. 339.
—— parryi, iii. 347.
—— parviflora, iii. 347.
—— paucifolia, iii. 347.
Agave peacockii, iii. 347.
—— *pendula*, iii. 349.
—— *perlucida*, iii. 350.
—— *picta*, iii. 339.
—— polyacantha, iii. 347.
—— *polyacantha*, iii. 340.
—— *polyanthoides*, iii. 340.
—— *polyphylla*, iii. 346.
—— *poselgerii*, iii. 343.
—— potatorum, iii. 347.
—— pruinosa, iii. 347.
—— pubescens, iii. 347.
—— pugioniformis, iii. 347.
—— regia, iii. 348.
—— revoluta, iii. 348.
—— rigida, iii. 348.
—— rigidissima, iii. 348.
—— roezliana, iii. 348.
—— rubescens, iii. 348.
—— rubicola, iii. 348.
—— rubrocincta, iii. 348.
—— rudis, iii. 348.
—— salmdyckii, iii. 348.
—— salmiana, iii. 349.
—— *salmiana*, iii. 339, 341, 343, 345.
—— *saponaria*, iii. 340.
—— sartorii, iii. 349.
—— saundersii, iii. 349.
—— *scabra*, iii. 352.
—— schidigera, iii. 349.
—— schlechtendalii, iii. 349.
—— *schnittspahnii*, iii. 349.
—— schottii, iii. 349.
—— scolymus, iii. 349.
—— *scolymus*, iii. 346.
—— seemanniana, iii. 349.
—— serrulata, iii. 350.
—— sessiliflora, iii. 350.
—— *sisalana*, iii. 348.
—— smithiana, iii. 350.
—— *sobolifera*, iv. 273.
—— *spicata*, iii. 340; iv. 273.
—— splendens, iii. 350.
—— stenophylla, iii. 350.
—— striata, iii. 350.
—— *subfalcata*, iii. 345.
—— tehuacanensis, iii. 350.
—— *teoxamulina*, iii. 340.
—— theometel, iii. 350.
—— thomsoniana, iii. 351.
—— *uncinata*, iii. 347.
—— undulata, iii. 351.
—— *univittata*, iii. 342.
—— univittata, iii. 351.
—— vanderwinneni, iii. 351.
—— variegata, iii. 351.

Agave vera-cruz, iii. 345.
—— *veræ-crucis*, iii. 345.
—— verschaffeltii, iii. 351.
—— victoriæ-reginæ, iii. 351.
—— *virginica*, iv. 273.
—— viridissima, iii. 351.
—— vivipara, iii. 351.
—— warelliana, iii. 351.
—— wislizeni, iii. 352.
—— *xalapensis*, iii. 347.
—— *xylacantha*, iii. 344, 352.
—— xylonacantha, iii. 352.
—— yuccæfolia, iii. 352.
AGDESTIS, iii. 30.
Agdestis, iv. 259.
Agdestis clematidea, i. 22; iii. 30; iv. 83.
—— *teterrima*, iii. 30.
Ageratum, iv. 163, 252.
Ageratum adscendens, ii. 80.
—— *adscendens*, iv. 287.
—— albidum, ii. 81.
—— *album*, iv. 50.
—— arbutifolium, ii. 81.
—— *arbutifolium*, ii. 78; iv. 287.
—— brachystephanum, ii. 81.
—— *cœlestinum*, ii. 81.
—— conyzoides, ii. 81.
—— *conyzoides*, iv. 102.
—— corymbosum, ii. 81; iv. 49.
—— echioides, ii. 81.
—— glanduliferum, ii. 82.
—— *glaucum*, iv. 50.
—— intermedium, iv. 102.
—— isocarphoides, ii. 82.
—— latifolium, ii. 82.
—— *lineare*, ii. 214.
—— mexicanum, ii. 82.
—— *mexicanum*, ii. 81.
—— microcarpum, ii. 82.
—— microcephalum, ii. 82.
—— *microphyllum*, ii. 78.
—— *muticum*, iv. 102.
—— paleaceum, ii. 83.
—— *pedatum*, ii. 214.
—— petiolatum, ii. 83.
—— *punctatum*, ii. 86.
—— salicifolium, ii. 83.
—— scabriusculum, ii. 83.
—— sessilifolium, ii. 83.
—— strictum, ii. 83.
—— tomentosum, ii. 84.
Agraulus mexicanus, iii. 551.
AGRIMONIA, i. 378.
Agrimonia parviflora, i. 378.
AGROPYRUM, iii. 585.
Agropyrum pilosum, iii. 585.
AGROSTIDEÆ, iii. 532.
AGROSTIS, iii. 550.
Agrostis, iii. 532; iv. 149, 150.
—— *atrovirens*, iii. 545.
—— berlandieri, iii. 550.
—— borealis, iii. 550.
—— bourgæi, iii. 550.
—— *brachyphylla*, iii. 552.
—— *canina*, iii. 550.
—— chinantlæ, iii. 550.
—— *cryptandra*, iii. 545.
—— *debilis*, iii. 540.
—— decumbens, iii. 550.
—— *divaricata*, iii. 533.
—— *domingensis*, iii. 545.
—— *dulcis*, iii. 552.
—— *elongata*, iii. 546.
—— ghiesbreghtii, iii. 551.
—— *glauca*, iii. 551.
—— *indica*, iii. 546.
—— *lanata*, iii. 549.
—— *laxiflora*, iii. 551.
—— *mexicana*, iii. 551.
—— *michauxi*, iii. 551.
—— ——, var. *alpina*, iii. 552.
—— *microsperma*, iii. 540.
—— *mucronata*, iii. 541.
—— *mutica*, iii. 551.
—— *nutans*, iii. 543.
—— *perennans*, iii. 551.
—— *pickeringii*, iii. 550.
—— *pubescens*, iii. 549.
—— *pungens*, iii. 548.
—— *purpurascens*, iii. 547.
—— *quadridentata*, iii. 541.
—— *ramulosa*, iii. 547.
—— *rigida*, iii. 542.
—— scabra, iii. 551.
—— *scabra*, iii. 551; iv. 279.
—— schaffneri, iii. 551.
—— schiedeana, iii. 551.
—— setifolia, iii. 551.
—— *setifolia*, iv. 296.
—— *setosa*, iii. 540.
—— *stipoides*, iii. 542.
—— tacubayensis, iii. 551.
—— tolucensis, iii. 551.
—— *tolucensis*, iii. 552; iv. 296.
—— varians, iii. 552.
—— *varians*, iv. 279, 296.
—— verticillata, iii. 552.
—— *verticillata*, iv. 279.
—— virescens, iii. 552.
—— *virescens*, iii. 551, 552; iv. 297.
—— *virginica*, iii. 548.
—— virletii, iii. 552.
Agrostis vulgaris, γ. *dulcis*, iii. 552.
Agrostomia, iii. 495.
AILOTHECA, ii. 149.
Ailotheca parthenioides, ii. 149.
Aira kœlerioides, iii. 555.
AIZOIDEÆ, i. 556.
ALAMANIA, iii. 221.
Alamania punicea, iii. 221.
Alamania punicea, iv. 304.
ALBERTEÆ, ii. 45.
ALCHEMILLA, i. 377.
Alchemilla, iv. 150, 157, 158, 159, 240.
Alchemilla alpestris, i. 377.
—— campestris, i. 377.
—— hirsuta, i. 377.
—— *hirsuta*, iv. 149.
—— orbiculata, i. 377.
—— *orbiculata*, iv. 284.
—— pectinata, i. 377.
—— sibbaldiæfolia, i. 377.
—— *sibbaldiæfolia*, iv. 149, 285.
—— tripartita, i. 377.
—— *tripartita*, i. 378; iv. 285.
—— velutina, iv. 34.
—— venusta, i. 377.
—— *venusta*, iv. 149.
—— vulcanica, i. 378.
—— *vulcanica*, iv. 149.
ALCHORNEA, iii. 130.
Alchornea grandiflora, iii. 130.
—— latifolia, iii. 130.
—— platyphylla, iii. 130.
—— similis, iii. 130.
Alcina ovatifolia, ii. 145.
—— *perfoliata*, ii. 146.
Aldama dentata, ii. 164.
Alectoroctonum cotinifolium, iii. 92.
—— *ovatum*, iii. 100.
—— *scotanum*, iii. 100.
—— *willdenowii*, iii. 92.
ALECTRA, iv. 77.
Alectra brasiliensis, iv. 77.
Alegria candida, i. 140.
Aleuritopteris affinis, iii. 672.
—— *candida*, iii. 673.
—— *cretacea*, iii. 673.
—— *farinosa*, iii. 614.
—— *lutea*, iii. 613.
—— *mexicana*, iii. 614.
—— *preslii*, iii. 614.
—— *pulveracea*, iii. 614, 672.
—— *schaffneri*, iii. 617.
Alevia leptostachya, iii. 121.
Alfonsia, iii. 415.
Algarobia dulcis, i. 344.
—— *glandulosa*, i. 344.

ALIBERTIA, ii. 39.
Alibertia edulis, ii. 39.
ALISMA, iii. 437.
Alisma andrieuxii, iii. 439.
—— *cordifolium*, iii. 439.
—— *echinocarpa*, iii. 438.
—— *ellipticum*, iii. 439.
—— *flavum*, iii. 440.
—— *macrophyllum*, iii. 439.
—— *plantago*, iii. 437.
—— *pubescens*, iii. 439.
—— tenellum, iii. 437.
—— *virgatum*, iii. 439.
ALISMACEÆ, iii. 437.
Alismaceæ, iv. 198, 204, 217, 226, 231.
ALLAMANDA, ii. 306.
Allamanda aubletii, ii. 306.
—— cathartica, ii. 306.
Allantodia, iii. 629.
Allardtia, iii. 319.
—— *cyanea*, iii. 320.
ALLENDEA, ii. 233.
Allendea lanceolata, ii. 233.
ALLIEÆ, iii. 377.
ALLIONIA, iii. 4.
Allionia aggregata, iii. 2.
—— *cervantesii*, iii. 3.
—— incarnata, iii. 4.
—— *malacoides*, iii. 4.
—— *violacea*, iii. 3.
ALLIUM, iii. 378.
Allium, iii. 148, 377.
Allium bigelovii, iii. 378.
—— *drummondii*, iii. 379.
—— *fragrans*, iv. 305.
—— *glandulosum*, iv. 298.
—— glandulosum, iii. 378.
—— kunthii, iii. 378.
—— longifolium, iii. 378.
—— *longifolium*, iii. 378.
—— *mobilense*, iii. 379.
—— mutabile, iii. 379.
—— plummeræ, iii. 379.
—— reticulatum, iii. 379.
—— scaposum, iii. 379.
—— *stellatum*, iii. 379.
—— *striatum*, iii. 378.
Allocarpus integrifolius, ii. 205.
—— *sabazioides*, ii. 206.
—— *scabrifolius*, ii. 206.
Allochlamys, iii. 11.
Allochroa mexicana, i. 454.
ALLOPLECTUS, ii. 483.
Alloplectus coriaceus, ii. 484.
—— forseithii, ii. 484.
—— glaber, ii. 484.
Alloplectus ichthyoderma, ii. 484.
—— macrophyllus, ii. 484.
—— multiflorus, ii. 484.
—— parviflorus, ii. 484.
—— peltatus, ii. 484.
—— strigosus, ii. 484.
—— tetragonus, ii. 484.
Allosorus alabamensis, iii. 618.
—— *andromedæfolius*, iii. 618.
—— andromedæfolius, iii. 618.
—— angustifolius, iii. 618.
—— asperus, iii. 618.
—— atropurpureus, iii. 618.
—— *atropurpureus*, iii. 619.
—— *chærophyllus*, iii. 620.
—— *ciliatus*, iii. 620.
—— *cordatus*, iii. 619.
—— *decompositus*, iii. 618.
—— *flexuosus*, iii. 619.
—— *formosus*, iii. 620.
—— glaucus, iii. 619.
—— *hirsutus*, iii. 619.
—— *inframarginalis*, iii. 620.
—— intramarginalis, iii. 620.
—— *karwinskii*, iii. 617.
—— marginatus, iii. 620.
—— *microphyllus*, iii. 615.
—— mucronatus, iii. 619.
—— *ochraceus*, iii. 613.
—— pulchellus, iii. 620.
—— *rigidus*, iii. 621.
—— *sagittatus*, iii. 619.
—— ternifolius, iii. 621.
ALNUS, iii. 165.
Alnus, iv. 260.
Alnus acuminata, iii. 165.
—— *acuminata*, iv. 293.
—— *arguta*, iii. 165.
—— castaneæfolia, iii. 166.
—— ferruginea, iii. 165.
—— genuina, iii. 165.
—— jorullensis, ii. 166.
—— *jorullensis*, iii. 165; iv. 148, 293.
—— mirbellii, iii. 165.
—— *mirbelii*, iv. 167.
—— *rufescens*, iii. 165.
—— typica, iii. 166.
Alocasia undipes, iii. 418.
Aloe, iv. 274.
—— *americana arboribus innascens*, iii. 314.
ALOINEÆ, iii. 369.
Aloma, iv. 252.
ALOMIA, ii. 79.
Alomia ageratoides, ii. 79; iv. 103.
—— *ageratoides*, ii. 80.
Alomia alata, ii. 79.
ALONSOA, ii. 440.
Alonsoa caulialata, ii. 440.
Alopecurus, iii. 531.
Aloysia floribunda, ii. 530.
—— *lycioides*, ii. 530.
Alpinia presliana, iii. 309.
—— *racemosa*, iii. 309.
—— *spicata*, iii. 309.
—— *strobilifera*, iii. 309.
ALSEIS, ii. 11.
Alseis blackiana, ii. 11.
Alsine mexicana, i. 70.
—— *mollughinea*, i. 70.
ALSINEÆ, i. 67.
Alsobia punctata, ii. 483.
ALSODEIA, i. 53.
Alsodeia deflexa, i. 54.
—— *flavescens*, i. 54.
—— sylvatica, i. 53.
ALSODEIEÆ, i. 53.
ALSOPHILA, iii. 593.
Alsophila, iv. 152.
—— *aculeata*, iii. 593.
—— armata, iii. 593.
—— *armata*, iii. 594.
—— *aurea*, iii. 593.
—— *bicrenata*, iii. 593.
—— blechnoides, iii. 594.
—— compta, iii. 594.
—— ferox, iii. 594.
—— *fulva*, iii. 592.
—— godmani, iii. 594.
—— infesta, iii. 594.
—— *mexicana*, iii. 593.
—— microphylla, iii. 594.
—— *myosuroides*, iii. 593.
—— *pilosa*, iii. 668.
—— pruinata, iii. 594.
—— *pruinata*, iv. 297.
—— salvini, iii. 595.
—— schiedeana, iii. 595.
Alstonia ciliata, ii. 301.
Alstrœmeria, iii. 336.
—— *acutifolia*, iii. 336.
—— *affinis*, iii. 336.
—— *caldasiana*, iii. 336.
—— *gloriosa*, iii. 336.
—— *hirtella*, iii. 336.
—— *miniata*, iii. 337.
—— *ovata*, iii. 337.
ALTERNANTHERA, iii. 17.
Alternanthera achyrantha, iii. 17.
—— *canescens*, iii. 21.
—— *ficoidea*, iii. 16.
—— herniarioides, iii. 17.
—— *lanuginosa*, iii. 15.

Alternanthera latifolia, iii. 22.
—— *polygonoides*, iii. 16.
—— *richardii*, iii. 22.
—— *sessilis*, iii. 17.
ALVARADOA, i. 215.
Alvaradoa amorphoides, i. 215.
—— mexicana, i. 215.
ALYSSINEÆ, i. 32.
AMAIOUA, ii. 39.
Amaioua guianensis, ii. 39.
AMARANTACEÆ, iii. 11; iv. 82, 107.
Amarantaceæ, iii. 12; iv. 190, 202, 215, 217, 225, 231, 233.
Amaranthus, iii. 13.
AMARANTUS, iii. 13.
Amarantus blitum, iii. 13.
—— *blitum*, iv. 82.
—— chlorostachys, iii. 13; iv. 114.
—— *crassipes*, iii. 14.
—— *floridus*, iii. 14.
—— hybridus, iii. 13.
—— hypochondriacus, iii. 13.
—— palmeri, iii. 14.
—— polygonoides, iii. 14.
—— retroflexus, iii. 14.
—— scariosus, iii. 14.
—— spinosus, iii. 14.
—— wrightii, iv. 82.
AMARYLLIDEÆ, iii. 331; iv. 108.
Amaryllideæ, iv. 196, 202, 215, 217, 226, 231.
Amaryllis formosissima, iii. 334.
—— *nervosa*, iii. 333.
Amblia juglandifolia, iii. 642.
Amblogyne polygonoides, iii. 14.
Amblostoma cernuum, iii. 218.
—— *tridactylum*, iii. 218.
Amblyanthera andrieuxii, ii. 316.
—— *convolvulacea*, ii. 316.
—— *foliosa*, ii. 316.
—— *karwinskii*, ii. 316.
—— *mexicana*, ii. 314.
—— *microcalyx*, ii. 314.
—— *oaxacana*, ii. 317.
—— *palustris*, ii. 317.
—— *torosa*, ii. 315.
—— *tubiflora*, ii. 315.
Ambrina ambrosioides, iii. 23.
—— *dissecta*, iii. 23.
—— *fœtida*, iii. 23.
AMBROSIA, ii. 150.
Ambrosia acanthicarpa, ii. 151.
—— artemisiæfolia, ii. 150.
—— canescens, ii. 150.
—— cheiranthifolia, ii. 150.
—— confertiflora, ii. 150.
Ambrosia crithmifolia, iv. 103.
—— fruticosa, ii. 150.
—— hispida, iv. 103.
—— *hispida*, iv. 103.
—— peruviana, ii. 150.
—— psilostachya, ii. 151.
Amellus pedunculatus, ii. 208.
Amerimnum brownei, i. 313.
AMHERSTIEÆ, i. 340.
AMICIA, i. 269.
Amicia, iv. 299.
Amicia zygomeris, i. 269.
—— *zygomeris*, iv. 284.
AMMANNIA, i. 435.
Ammannia catholica, i. 435.
—— dentifera, i. 436.
—— latifolia, i. 436.
—— *occidentalis*, i. 435.
—— *ramosior*, i. 435.
—— sanguinolenta, i. 436.
—— wrightii, i. 436.
AMMANNIEÆ, i. 435.
AMMINEÆ, i. 563.
AMMOBROMA, ii. 286.
Ammobroma sonoræ, ii. 286.
Ammoselinum popei, iv. 46.
Amomis, i. 409.
Amomum racemosum, iii. 309.
AMOREAUXIA, i. 55.
Amoreauxia malvæfolia, i. 55.
—— palmatifida, i. 55.
—— *palmatifida*, i. 56; iv. 8.
—— *schiedeana*, i. 55, 56; iv. 8.
—— wrightii, i. 56; iv. 8.
AMORPHA, i. 236.
Amorpha californica, i. 236.
—— *fruticosa*, i. 236.
—— lævigata, i. 236.
—— pubescens, i. 236.
—— rabiæ, i. 236.
Amorphophallus titanum, iv. 278.
AMPELIDEÆ, i. 202; iv. 22, 98.
Ampelideæ, iv. 177, 204, 224.
Ampelopsis, i. 202, 203; iv. 23.
Amphiblestra simplex, iii. 607.
AMPHICARPÆA, i. 297.
Amphicarpæa, iv. 229.
Amphicarpæa monoica, i. 297.
—— *sarmentosa*, i. 297.
Amphicosmia hartii, iv. 95.
Amphiglottis lurida, iii. 225.
—— *secunda*, iii. 239.
AMPHILOPHIUM, ii. 493.
Amphilophium molle, ii. 493.
—— paniculatum, ii. 493.
Amphymenium pubescens, i. 316.
AMSINCKIA, ii. 379.
Amsinckia intermedia, ii. 379.
—— lycopsoides, ii. 379.
—— mexicana, ii. 379.
—— *mexicana*, iv. 291.
AMSONIA, ii. 308.
Amsonia, iv. 229.
Amsonia longiflora, ii. 308.
—— tomentosa, ii. 308.
Amygdalus glandulosa, iv. 34.
—— *microphylla*, i. 368.
AMYRIDEÆ, i. 180.
AMYRIS, i. 180.
Amyris bipinnata, i. 180.
—— *bipinnata*, iv. 19.
—— *linanoe*, i. 178.
—— *pubescens*, i. 179.
—— tecomaca, i. 180.
—— ? *tecomaca*, iv. 21.
—— thyrsiflora, i. 180.
—— *ventricosa*, i. 179; iv. 19.
ANACARDIACEÆ, i. 217; iv. 24, 98.
Anacardiaceæ, iv. 178, 203, 215, 217, 225.
ANACARDIEÆ, i. 217.
ANACARDIUM, i. 220.
Anacardium americanum, i. 221.
—— occidentale, i. 221.
—— rhinocarpus, i. 221; iv. 24.
—— *rhinocarpus*, iv. 163.
Anacheilium cochleatum, iii. 228.
Anachyris setosa, iii. 483.
Anadendron punctulatum, iii. 427.
Anagallis arvensis, ii. 289; iv. 67.
—— *pumila*, ii. 289.
Anaitis acapulcensis, ii. 154, 155.
ANANAS, iii. 314.
Ananas sativus, iii. 314.
Ananassa sativa, iii. 314.
Anantherix decumbens, ii. 321.
—— *paniculatus*, ii. 321.
Anapausia aliena, iii. 683.
Anatherum bicorne, iii. 525.
—— *domingense*, iii. 530.
—— *macrurum*, iii. 528.
—— *virginicum*, iii. 530.
ANAXAGOREA, i. 17.
Anaxagorea acuminata, i. 17.
—— crassipetala, i. 17.
Anchusa tuberosa, iv. 72.
Ancistrum lævigatum, i. 378.
Ancyrostemma micranthum, i. 472.
ANDIRA, i. 320.
Andira, iv. 230.
Andira excelsa, i. 320.
—— *excelsa*, iv. 230.
—— *racemosa*, i. 320.

Andræa, iv. 150.
Andrieuxia mexicana, ii. 156.
ANDROCENTRUM, ii. 509.
Androcentrum multiflorum, ii. 509.
ANDROCHILUS, iii. 211.
Androchilus campestris, iii. 211.
Andromachia deppeana, ii. 232.
ANDROMEDA, ii. 281.
Andromeda, iv. 148.
Andromeda ferruginea, ii. 282.
—— mexicana, ii. 282.
—— *rigida*, ii. 282.
Andromicia cubensis, iii. 419.
Androphoranthus glandulosus, iii. 120.
ANDROPOGON, iii. 524.
Andropogon, iii. 518; iv. 213.
Andropogon albescens, iii. 525.
—— *albescens*, iii. 530.
—— *allionii*, iii. 524.
—— *alopecuroides*, iii. 520.
—— *angustatus*, iii. 525.
—— *angustifolius*, iii. 522.
—— *anthistirioides*, iii. 529; iv. 301.
—— apricus, iii. 525.
—— argenteus, iii. 525.
—— *argenteus*, iii. 528.
—— attenuatus, iii. 525.
—— *avenaceus*, iii. 525, 530.
—— bicornis, iii. 525.
—— bourgæi, iii. 525.
—— bracteatus, iii. 525.
—— brevifolius, iii. 526.
—— *canescens*, iii. 523.
—— *ciliatus*, iii. 530.
—— cirratus, iii. 526.
—— condensatus, iii. 526.
—— *condensatus*, iii. 530.
—— *cortortus*, iii. 524.
—— *dactyloides*, iii. 523.
—— *debilis*, iii. 626.
—— *densus*, iii. 526.
—— *diatherus*, iii. 526.
—— *digitatus*, iii. 523.
—— *dispersus*, iii. 534.
—— *dissolutus*, iii. 523.
—— *divaricatus*, iii. 533.
—— *domingensis*, iii. 530.
—— elythrophyllus, iii. 526.
—— emersus, iii. 527.
—— *erianthus*, iii. 520.
—— feensis, iii. 527.
—— *firmus*, iii. 524.
—— *floridus*, iii. 526.
—— *francavillanus*, iii. 530.
—— galeottii, iii. 527.
—— glaucescens, iii. 527.
Andropogon gracilis, iii. 529.
—— hirsutus, iii. 527.
—— *hirtiflorus*, iii. 528.
—— hirtifolius, iii. 527.
—— *humboldtianus*, iii. 530.
—— *incompletus*, iii. 531.
—— *jacquinianus*, iii. 533.
—— laguroides, iii. 527.
—— *latifolius*, iii. 522.
—— *leptophyllus*, iii. 529.
—— leucopogon, iii. 528.
—— *lhotzkyi*, iii. 526.
—— liebmanni, iii. 528.
—— lolioides, iii. 528.
—— macrothrix, iii. 528.
—— macrourus, iii. 528.
—— malacostachyus, iii. 528.
—— *melanocarpus*, iii. 524.
—— *minarum*, iii. 530.
—— *mollis*, iii. 523.
—— *montufari*, iii. 523.
—— myosurus, iii. 528.
—— *nigrescens*, iii. 534.
—— *nutans*, iii. 531.
—— *obtusifolius*, iii. 526.
—— *paniculatus*, iii. 526.
—— perforatus, iii. 529.
—— *preslii*, iii. 529.
—— pubiflorus, iii. 529.
—— rectirhachis, iii. 529.
—— ruprechtii, iii. 529.
—— *saccarhoides*, iii. 525, 527.
—— ——, var. *laguroides*, iii. 527.
—— schaffneri, iii. 529.
—— schlumbergerii, iii. 529.
—— scoparius, iii. 529.
—— *scoparius*, iii. 526.
—— *scrobiculatus*, iii. 524.
—— *secundus*, iii. 523.
—— stipoides, iii. 527.
—— *stipoides*, iii. 523, 530.
—— *tenellus*, iii. 526.
—— tener, iii. 529.
—— tenuirachis, iii. 529.
—— *ternatus*, iii. 528.
—— *vaginatus*, iii. 530.
—— velatus, iii. 530.
—— virginicus, iii. 530.
ANDROPOGONEÆ, iii. 518.
ANDROSACE, ii. 288.
Androsace occidentalis, ii. 288.
Aneilema, iii. 389.
—— *floribundum*, iii. 396.
ANEMIA, iii. 692.
Anemia, iii. 692; iv. 281.
Anemia adiantifolia, iii. 692.
—— affinis, iii. 693
Anemia breuteliana, iii. 693.
—— *ciliata*, iii. 693.
—— *collina*, iii. 693.
—— *cordifolia*, iii. 694.
—— *deltoidea*, iii. 694.
—— *dissecta*, iii. 693.
—— *filiformis*, iii. 693.
—— *flexuosa*, iii. 694.
—— *fraxinifolia*, iii. 694.
—— *fulva*, iii. 694.
—— *hænkei*, iii. 694.
—— *helveola*, iii. 693.
—— hirsuta, iii. 693.
—— *hirsuta*, var. *α*, *integrifolia*, iii. 693.
—— *humilis*, iii. 694.
—— *incisa*, iii. 693.
—— *mandioccana*, iii. 693.
—— mexicana, iii. 693.
—— oblongifolia, iii. 694.
—— *opaca*, iii. 693.
—— phyllitidis, iii. 694.
—— *phyllitidis*, iii. 697.
—— *pilosa*, iii. 694.
—— *pumila*, iii. 694.
—— *repens*, iii. 693.
—— *seemannii*, iii. 694.
—— *speciosa*, iii. 693.
—— tomentosa, iii. 694.
—— *villosa*, iii. 694.
Anemidictyon phyllitidis, iii. 694.
Anemiopsis californica, iii. 45; iv. 141.
—— *bolanderi*, iii. 45.
ANEMONE, i. 5.
Anemone caroliniana, i. 5.
—— *caroliniana*, iv. 141.
—— mexicana, i. 5.
—— *tenella*, i. 5.
ANEMONEÆ, i. 3.
ANEMOPÆGMA, ii. 492.
Anemopægma orbiculatum, ii. 493.
ANETANTHUS, ii. 489.
Anetanthus parviflorus, ii. 489.
Anetium citrifolium, iii. 682.
ANGELICA, i. 569.
Angelica mexicana, i. 569; iv. 46.
ANGELONIA, ii. 440.
Angelonia angustifolia, ii. 440.
Angiopteris, iii. 695.
Angræcum schiedei, iii. 292.
ANGUILLARIEÆ, iii. 381.
Angulosa grandiflora, iii. 256.
—— *hernandezii*, iii. 257, 258.
—— *superba*, iii. 260.
ANGURIA, i. 484.
Anguria, i. 484.

Anguria eriantha, i. 485.
—— longipedunculata, i. 484.
—— *makoyana*, i. 485.
—— pedata, i. 484; iv. 40.
—— ——, var. γ. affinis, iv. 40.
—— trifoliata, iv. 40.
—— umbrosa, i. 484.
—— *wageneriana*, i. 485.
—— warscewiczii, i. 484; iv. 40.
Anhalonium areolosum, i. 503.
—— elongatum, i. 509.
—— *kotchubeyi*, i. 525.
—— prismaticum, i. 519.
—— *pulvilligerum*, i. 509.
—— *retusum*, i. 519.
—— sulcatum, i. 525.
ANISACANTHUS, ii. 522.
Anisacanthus greggii, ii. 522.
—— junceus, ii. 522.
—— pumilus, ii. 522.
—— thurberi, ii. 523.
—— *thurberi*, ii. 522.
—— virgularis, ii. 523.
—— *virgularis*, ii. 522.
—— wrightii, ii. 523.
Aniseia martinicensis, ii. 390.
Anisogonium kunzei, iii. 635.
—— ternatum, iii. 640.
Anisophyllum amœnum, iii. 90.
—— *crassipes*, iii. 97.
—— *densiflorum*, iii. 90.
—— *humboldtii*, iii. 95.
—— *hyssopifolium*, iii. 96.
—— *leucanthum*, iii. 96.
—— *lindenianum*, iii. 90.
—— *macropus*, iii. 97.
—— *senile*, iii. 101.
—— *tenuiflorum*, iii. 102.
—— *velleriflorum*, iii. 101.
ANODA, i. 101.
Anoda, iv. 147.
Anoda acerifolia, i. 101.
—— *brachyantha*, i. 102.
—— crenatiflora, i. 101.
—— cristata, i. 101.
—— *dilleniana*, i. 101.
—— hastata, i. 101.
—— incarnata, i. 101.
—— lanceolata, i. 101.
—— *parviflora*, i. 101.
—— pentaschista, i. 102.
—— pubescens, i. 102.
—— *punicea*, i. 113.
—— triangularis, i. 102.
—— *triloba*, i. 101.
ANONA, i. 18.
Anona bibracteata, i. 15.
Anona bonplandiana, i. 19.
—— cherimolia, i. 18.
—— *cherimolia*, iv. 147.
—— cinerea, i. 18.
—— depressa, i. 18.
—— echinata, i. 19.
—— excelsa, i. 19.
—— globiflora, i. 19.
—— involucrata, i. 19.
—— liebmanniana, i. 19.
—— *mucosa*, i. 18.
—— muricata, i. 19.
—— palustris, i. 19.
—— purpurea, i. 19.
—— reticulata, i. 19.
—— *sericea*, var., i. 19.
—— squamosa, i. 19.
—— *squamosa*, i. 18.
—— *sylvatica*, i. 19.
—— *tripetala*, i. 18.
ANONACEÆ, i. 14; iv. 96.
Anonaceæ, iv. 171, 203, 214, 216.
Anoplophyllum, iii. 319.
Anosporum cubense, iii. 461.
Anotis longiflora, ii. 30.
ANREDERA, iii. 27.
Anredera scandens, iii. 28.
—— *spicata*, iii. 28.
—— *vesicaria*, iii. 28.
—— *vesiculosa*, iii. 28.
ANTHÆNANTIA, iii. 483.
Anthænantia lanata, iii. 483.
ANTHEMIDEÆ, ii. 229.
Anthemideæ, iv. 184.
Anthemis buphthalmoides, ii. 156.
—— *globosa*, ii. 159.
—— *lutescens*, ii. 159.
—— *ovalifolia*, ii. 156.
—— *sinuata*, ii. 160.
—— *triloba*, ii. 160.
ANTHEPHORA, iii. 518.
Anthephora, iv. 232, 280.
—— *axilliflora*, iii. 566.
—— *belangeri*, iii. 516.
—— elegans, iii. 518.
ANTHERICUM, iii. 374.
Anthericum aurantiacum, iv. 1.
—— *ciliatum*, iii. 374.
—— flavescens, iii. 374.
—— *flavescens*, iv. 91.
—— humboldtii, iii. 374.
—— leptophyllum, iii. 375.
—— macrophyllum, iv. 91.
—— nanum, iii. 375.
—— *reflexum*, iii. 376.
—— rude, iii. 375.
—— scabrellum, iii. 375.
Anthericum sessile, iii. 331.
—— skinneri, iii. 375.
—— stenocarpum, iii. 375.
—— torreyi, iii. 375.
—— vestitum, iii. 375.
ANTHERYLIUM, i. 449.
Antherylium nudiflorum, i. 449.
—— *nudiflorum*, iv. 243.
Anthistiria foliosa, iii. 525.
—— *humboldtii*, iii. 526.
—— *reflexa*, iii. 525.
Anthoceros crispa, iv. 148.
ANTHOSPERMEÆ, ii. 54.
Anthoxanthum, iii. 531.
—— *giganteum*, iii. 520.
ANTHURIUM, iii. 429.
Anthurium, iii. 435; iv. 213, 278.
Anthurium æmulum, iii. 429.
—— agnatum, iii. 429.
—— andicola, iii. 429.
—— bakeri, iii. 430.
—— bombacifolium, iii. 430.
—— brachygonatum, iii. 430.
—— consobrinum, iii. 430.
—— cordifolium, iii. 430.
—— crassinervium, iii. 430.
—— *cucullatum*, iii. 429.
—— cuspidifolium, iii. 430.
—— dolosum, iii. 434.
—— flexile, iii. 430.
—— formosum, iii. 430.
—— fraternum, iii. 431.
—— friedrichsthalii, iii. 431.
—— *ghiesbrechtii*, iii. 433.
—— hoffmannii, iii. 431.
—— holtonianum, iii. 431.
—— karwinskii, iii. 431.
—— lancifolium, iii. 431.
—— *lapathifolium*, iii. 432.
—— leucocarpum, iii. 434.
—— leuconeurum, iii. 431.
—— liebmannii, iii. 431.
—— *lindenianum*, iii. 431.
—— *margaritaceum*, iii. 431.
—— mexicanum, iii. 431.
—— *mexicanum*, iii. 434.
—— microspadix, iii. 433.
—— montanum, iii. 431.
—— obtusifolium, iii. 432.
—— ochranthum, iii. 432.
—— œrstedianum, iii. 432.
—— pallens, iii. 432.
—— panduræforme, iii. 432.
—— *panduratum*, iii. 432.
—— parvispathum, iii. 432.
—— *pedatifidum*, iii. 433
—— pedatoradiatum, iii. 433

Anthurium podophyllum, iii. 433.
—— *polytomum*, iii. 433.
—— porrectum, iii. 433.
—— protensum, iii. 433.
—— *pseudopodophyllum*, iii. 433.
—— *quindiuense*, iii. 431.
—— *recusatum*, iii. 430.
—— rigidulum, iii. 433.
—— salviniæ, iii. 433.
—— scandens, iii. 434.
—— scherzerianum, iii. 434.
—— schlechtendalii, iii. 434.
—— spectabile, iii. 435.
—— subcordatum, iii. 435.
—— subsignatum, iii. 435.
—— tapinostachyum, iii. 435.
—— umbrosum, iii. 435.
—— violaceum, iii. 434.
—— *violaceum*, β. *forma angustifolia*, iii. 434.
—— wendlandii, iii. 435.
—— *williamsii*, iii. 434.
Anticlea mexicana, iii. 382.
—— *volcanica*, iii. 382.
ANTIDAPHNE, iii. 87.
Antidaphne viscoidea, iii. 87.
ANTIGONON, iii. 37.
Antigonon, iv. 259.
Antigonon cinerascens, iii. 37.
—— cordatum, iii. 37.
—— guatemalense, iii. 37.
—— *insigne*, iii. 37.
—— leptopus, iii. 37; iv. 107.
—— *leptopus*, iii. 144.
Antigramme, iii. 641.
ANTIPHYTUM, ii. 379.
Antiphytum, iv. 72.
Antiphytum floribundum, ii. 379.
—— *floribundum*, iv. 72.
—— heliotropoides, ii. 379.
—— *heliotropoides*, iv. 72.
—— *mexicanum*, ii. 379.
—— parryi, iv. 72.
ANTIRRHINUM, ii. 441.
Antirrhinum maurandioides, ii. 441.
ANTIRRHŒA, ii. 42.
Antirrhœa dichotoma, ii. 42.
—— protracta, ii. 42.
—— trichanta, ii. 42.
ANTROPHYUM, iii. 680.
Antrophyum cayennense, iii. 680.
—— *discoideum*, iii. 680.
—— ensiforme, iii. 680; iv. 116.
—— *ensiforme*, iv. 298.
—— *falcatum*, iii. 680.
—— *feei*, iii. 680.
—— *galeottii*, iii. 680.
Antrophyum lanceolatum, iii. 680.
—— lineatum, iii. 680.
—— *pumilum*, iii. 680.
—— subsessile, iii. 680.
APEIBA, i. 141.
Apeiba tibourbou, i. 141.
APEIBEÆ, i. 141.
Apera liebmanni, iii. 554.
APHANOSTEPHUS, ii. 117.
Aphanostephus arizonicus, ii. 117.
—— humilis, 117; iv. 52.
—— ramosissimus, ii. 118.
—— ramosus, ii. 118.
—— *riddellii*, ii. 118.
APHELANDRA, ii. 512.
Aphelandra acutifolia, ii. 512.
—— aurantiaca, ii. 512.
—— deppeana, ii. 512.
—— hænkeana, ii. 512.
—— hydromestus, ii. 512.
—— pectinata, ii. 512; iv. 113.
—— pulcherrima, ii. 513.
—— schiedeana, ii. 513.
—— sinclairiana, ii. 513.
—— tridentata, ii. 513.
—— verticillata, ii. 513.
Aphora humilis, iii. 119.
—— *lanceolata*, iii. 119.
Aphyllanthes, iii. 376.
APHYLLON, ii. 468.
Aphyllon dugesii, iv. 77.
—— fasciculatum, ii. 468.
—— ludovicianum, ii. 468.
—— multiflorum, ii. 468.
Apiospermum obcordatum, iii. 417.
APIUM, i. 565.
Apium echinatum, i. 565.
—— graveolens, i. 565.
—— leptophyllum, i. 566.
—— popei, iv. 46.
Aplodiscus ramulosus, ii. 131.
Aplopappus, ii. 114.
—— *discoideus*, ii. 115.
—— *gramineus*, ii. 114.
—— *gymnocephalus*, ii. 121.
—— *ramulosus*, ii. 131.
APOCYNACEÆ, ii. 306; iv. 68, 104.
Apocynaceæ, iv. 186, 202, 215, 217, 225, 229, 231, 233.
APOCYNUM, ii. 312.
Apocynum androsæmifolium, ii. 313.
—— *androsæmifolium*, iv. 68.
—— cannabinum, ii. 313; iv. 68.
—— *cordatum*, ii. 317.
—— *hypericifolium*, ii. 313.
APODANTHERA, i. 486.
Apodanthera aspera, i. 486.
—— buræavi, i. 486.
—— galeottii, i. 486.
—— gracilis, i. 486.
—— *gracilis*, iv. 40.
—— undulata, i. 486.
Apogonia glabrata, iii. 521.
—— *ramosa*, iii. 521.
APOPLANESIA, i. 235.
Apoplanesia paniculata, i. 235.
Aporocactus flagelliformis, i. 542.
APTERIA, iii. 196.
Apteria hymenanthera, iii. 197.
—— *lilacina*, iii. 197.
—— setacea, iii. 197.
AQUILEGIA, i. 282.
Aquilegia, iv. 235.
Aquilegia chrysantha, i. 8.
—— *leptoceras*, var. *chrysantha*, i. 8.
—— ——, var. *flava*, i. 8.
—— longissima, iv. 2.
—— *mexicana*, i. 8.
—— skinneri, i. 8.
ARABIDÆ, i. 28.
ARABIS, i. 30.
Arabis mexicana, iv. 4.
—— patula, i. 30.
—— *resediflora*, i. 28.
—— runcinata, iv. 4.
ARACHIS, i. 273.
Arachis hypogæa, i. 273.
Arachnimorpha, ii. 16.
Arachnothryx, ii. 16.
—— *buddleoides*, ii. 17.
—— *elongata*, ii. 19.
—— *laniflora*, ii. 20.
—— *leucophylla*, ii. 21.
ARALIA, i. 571.
Aralia, iv. 146, 147, 229.
Aralia brevifolia, i. 571.
—— *capitata*, i. 573.
—— *echinops*, i. 573.
—— humilis, i. 572.
—— *jatrophæfolia*, i. 573.
—— pubescens, i. 572.
—— regeliana, i. 572.
—— *xalapensis*, i. 574.
ARALIACEÆ, i. 571; iv. 46.
Araliaceæ, iv. 182, 203, 217, 229.
ARAUCARIEÆ, iii. 185.
ARBUTUS, i. 276.
Arbutus, iv. 127, 148, 254, 302, 303, 304, 314.
Arbutus densiflora, ii. 276.
—— *discolor*, ii. 278.
—— floribunda, ii. 276.

Arbutus floribunda, iv. 290.
—— glandulosa, ii. 276.
—— *laurifolia*, ii. 276.
—— laurina, ii. 276.
—— macrophylla, ii. 276.
—— *macrophylla*, iv. 290.
—— menziesii, ii. 276.
—— mollis, ii. 277.
—— ovata, ii. 277.
—— paniculata, ii. 277.
—— petiolaris, ii. 277.
—— *pilosa*, ii. 280.
—— *procera*, ii. 276.
—— prunifolia, ii. 277.
—— pubescens, ii. 277.
—— *rubescens*, ii. 279.
—— spinulosa, ii. 277.
—— *spinulosa*, iv. 290.
—— *tomentosa*, ii. 279.
—— varians, ii. 277.
—— xalapensis, ii. 277.
—— *xalapensis*, ii. 279.
ARCEUTHOBIUM, iii. 83.
Arceuthobium americanum, iii. 84.
—— campylopodum, iii. 83.
—— *campylopodum*, iv. 293.
—— cryptopodum, iii. 83.
—— *cryptopodum*, iv. 293.
—— oxycedri, iii. 84.
—— *oxycedri*, iv. 293.
—— *vaginatum*, iii. 83.
Archytæa, i. 98.
Arctocalyx endlicherianus, ii. 481.
—— *insignis*, ii. 481.
ARCTOSTAPHYLOS, ii. 277.
Arctostaphylos, iv. 127, 254, 303, 314.
Arctostaphylos angustifolia, ii. 278.
—— arbutoides, ii. 278.
—— arguta, ii. 278.
—— attenuata, ii. 278.
—— *discolor*, ii. 278.
—— glaucescens, ii. 278.
—— hartwegiana, ii. 278.
—— ledifolia, ii. 278.
—— *ledifolia*, iv. 290.
—— longifolia, ii. 278.
—— mucronata, ii. 279.
—— mucronifera, ii. 279.
—— *mucronifera*, ii. 278.
—— *nitida*, ii. 278.
—— oaxacana, ii. 279.
—— *oaxacana*, ii. 278.
—— polifolia, ii. 279.
—— pungens, ii. 279.
—— *pungens*, iv. 149, 290.
—— rubescens, ii. 279.
Arctostaphylos spinulosa, ii. 278.
—— tomentosa, ii. 279.
—— *tomentosa*, iv. 142.
ARCTOTIDEÆ, ii. 250.
ARCYNOSPERMUM, i. 120.
Arcynospermum nodiflorum, i. 120.
ARDISIA, ii. 291.
Ardisia, ii. 292; iv. 156, 157, 299.
Ardisia bracteosa, ii. 292.
—— calycosa, ii. 292.
—— capollina, ii. 292.
—— caribæa, ii. 292.
—— compressa, ii. 292.
—— coriacea, ii. 292.
—— *crenulata*, ii. 291.
—— cuspidata, ii. 293.
—— decipiens, ii. 293.
—— escallonioides, ii. 293.
—— fusca, ii. 293.
—— glanduloso-marginata, ii. 293.
—— *glanduloso-marginata*, iv. 290.
—— *involucrata*, ii. 292.
—— irasuensis, ii. 293.
—— *irasuensis*, iv. 159.
—— *irazuensis*, iv. 290.
—— lævis, ii. 293.
—— *lævis*, iv. 159, 290.
—— liebmannii, ii. 293.
—— *melanosticta*, ii. 291.
—— nicaraguensis, ii. 293.
—— nigrescens, ii. 293.
—— nigro-punctata, ii. 293.
—— *nigro-punctata*, iv. 157, 290.
—— oliveri, ii. 293.
—— opegrapha, ii. 293.
—— *opegrapha*, ii. 292.
—— pellucida, ii. 293.
—— pickeringia, ii. 294.
—— ramiflora, ii. 294.
—— revoluta, ii. 294.
—— xylosteoides, ii. 294.
Ardisiæ, ii. 290.
ARENARIA, i. 69.
Arenaria, i. 67, 71, 72; iv. 149, 151.
Arenaria alsinoides, i. 69.
—— *alsinoides*, iv. 283.
—— bourgæi, i. 69.
—— *bourgæi*, iv. 10.
—— bryoides, i. 69.
—— *bryoides*, i. 70; iv. 283.
—— decussata, i. 70.
—— *decussata*, iv. 149, 283.
—— *diffusa*, i. 69.
—— guatemalensis, i. 70.
—— leptophylla, i. 70.
—— *leptophylla*, iv. 150.
Arenaria liebmanniana, iv. 10.
—— lycopodioides, i. 70.
—— *lycopodioides*, iv. 283.
—— mexicana, i. 70.
—— molluginea, i. 70.
—— *nemorosa*, i. 69.
—— peyritschii, iv. 10.
—— reptans, i. 70.
—— rohrbachiana, iv. 10.
—— scopulorum, i. 71.
—— *scopulorum*, iv. 10, 283.
—— serpens, iv. 10.
—— *setacea*, iv. 149.
—— *striata*, i. 71.
Arenbergia, ii. 348.
—— *glauca*, ii. 348.
ARETHUSA, iii. 304.
Arethusa, iv. 229, 268.
Arethusa rosea, iii. 304.
—— *tigridiæfolia*, iv. 89.
ARGEMONE, i. 26.
Argemone fruticosa, i. 26; iv. 4.
—— grandiflora, i. 26.
—— hispida, i. 27.
—— *hispida*, iv. 4.
—— mexicana, i. 27; iv. 97, 111.
—— *mexicana*, i. 26.
—— ochroleuca, i. 27.
—— platyceras, iv. 4.
ARGITHAMNIA, iii. 118.
Argithamnia, iv. 114.
Argithamnia fendleri, iii. 119.
—— guatemalensis, iii. 119.
—— heterantha, iii. 119.
—— lanceolata, iii. 119.
—— major, iii. 119.
—— minor, iii. 119.
—— neomexicana, iii. 119.
—— schiedeana, iii. 119.
Argyreia oblonga, ii. 391.
Argyrochæta bipinnatifida, ii. 148.
Argyrothamnia, iii. 118.
Ariocarpus retusus, i. 519.
ARISÆMA, iii. 417.
Arisæma dracontium, iii. 417.
—— macrospathum, iii. 418.
ARISTIDA, iii. 532.
Aristida, iv. 309.
Aristida barbata, iii. 532.
—— *berlandieri*, iii. 534.
—— *bromoides*, iii. 535.
—— capillacea, iii. 532.
—— *chapadensis*, iii. 532.
—— *coarctata*, iii. 535.
—— *curvifolia*, iii. 533.
—— *decolorata*, iii. 533.
—— *divaricata*, iii. 533, 535.

Aristida flexuosa, iii. 533.
—— geminiflora, iii. 533.
—— glauca, iii. 533, 534.
—— *grandiflora*, iii. 535.
—— grisebachiana, iii. 533.
—— humboldtiana, iii. 533.
—— *implexa*, iii. 532.
—— interrupta, iii. 533.
—— *jacquiniana*, iii. 533.
—— jorullensis, iii. 534.
—— karwinskiana, iii. 534.
—— liebmanni, iii. 534.
—— longiramea, iii. 534.
—— muehlenbergioides, iii. 534.
—— nigrescens, iii. 534.
—— orizabensis, iii. 534.
—— purpurea, iii. 534.
—— *riparia*, iii. 532.
—— scabra, iii. 534.
—— *scabra*, iv. 296.
—— schaffneri, iii. 534.
—— schiedeana, iii. 535.
—— setifolia, iii. 535.
—— spadicea, iii. 535.
—— stricta, iii. 535.
—— tenuis, iii. 535.
—— ternipes, iii. 535.
—— virleti, iii. 535.
ARISTOLOCHIA, iii. 41.
Aristolochia, iv. 213.
Aristolochia angustifolia, iii. 43.
—— arborea, iii. 41.
—— bracteosa, iii. 41.
—— brevipes, iii. 41.
—— *conferta*, iii. 44.
—— costaricensis, iii. 41.
—— flexuosa, iii. 42.
—— fœtens, iii. 42; iv. 114.
—— fœtida, iii. 42.
—— galeottii, iii. 42.
—— gibbosa, iii. 42.
—— *gigas*, iii. 42.
—— glabra, iii. 42.
—— *glandulosa*, iii. 42.
—— glandulosa, iii. 42.
—— grandiflora, iii. 42, 43.
—— inflata, iii. 42.
—— karwinskii, iii. 42.
—— *macradenia*, iii. 42.
—— maxima, iii. 43.
—— mathewsii, iii. 43.
—— micrantha, iii. 43.
—— *odoratissima*, iii. 42.
—— odoratissima, iii. 43.
—— orbicularis, iii. 43.
—— ovalifolia, iii. 43.
—— pardina, iii. 43; iv. 84.
Aristolochia pavoniana, iii. 43.
—— *repens*, iii. 44.
—— *reticulata*, iii. 43.
—— *scandens*, iii. 44.
—— sericea, iii. 43.
—— subclausa, iv. 84.
—— taliscana, iii. 44.
—— tricaudata, iii. 44.
—— trilobata, iii. 44.
—— uhdeana, iii. 44.
—— valentina, iii. 44.
—— variifolia, iii. 44.
—— veraguensis, iii. 44.
—— wrightii, iii. 41.
ARISTOLOCHIACEÆ, iii. 41; iv. 84.
Aristolochiaceæ, iv. 191, 203.
Armeria vulgaris, ii. 287.
AROIDEÆ, iii. 417.
Aroideæ, iv. 198, 202, 215, 217, 229, 277.
ARPOPHYLLUM, iii. 208.
Arpophyllum alpinum, iii. 208.
—— *alpinum*, iv. 294.
—— giganteum, iii. 208.
—— *giganteum*, iii. 209.
—— medium, iii. 208.
—— spicatum, iii. 208.
—— *spicatum*, iv. 294, 304.
Arrabidea subincana, ii. 491.
ARRACACIA, i. 563.
Arracacia acuminata, i. 564.
—— *acuminata*, iv. 286.
—— atropurpurea, i. 564.
—— decumbens, i. 564.
—— *decumbens*, iv. 286.
—— glaucescens, i. 564.
—— tolucensis, i. 564.
—— *tolucensis*, iv. 286.
Arrhostoxylon achimeniflorum, ii. 503.
—— *jussieuoides*, ii. 505.
Arrhostoxylum stemonacanthoides, ii. 507.
Artanthe, iv. 159.
—— *adunca*, iii. 45.
—— *aegeirophylla*, iii. 46.
—— *aurita*, iii. 45.
—— *bredemeyeri*, iii. 46.
—— *caladiifolia*, iii. 46.
—— *cardiophylla*, iii. 46.
—— *casimiriana*, iii. 46.
—— *caudata*, iii. 50.
—— *chamissonis*, iii. 47.
—— *corylifolia*, iii. 48.
—— *crassispicata*, iii. 47.
—— *decipiens*, iii. 48.
Artanthe decurrens, iii. 56.
—— *grandifolia*, iii. 49.
—— *hirsuta*, iii. 49.
—— *jalapense*, iii. 49.
—— *karwinskiana*, iii. 49.
—— *lapathifolia*, iii. 50.
—— *leptura*, iii. 50.
—— *leucophylla*, iii. 57.
—— *lineata*, iii. 50.
—— *lucæana*, iii. 50.
—— *macrophylla*, iii. 50.
—— *magnifica*, iii. 52.
—— *melanosticta*, iii. 51.
—— *mexicana*, iii. 51.
—— *mollicoma*, iii. 52.
—— *nitidula*, iii. 52.
—— *oblonga*, iii. 52.
—— *pilosiuscula*, iii. 53.
—— *plantaginea*, iii. 53.
—— *pothomorphe*, iii. 54.
—— *reticulosa*, iii. 54.
—— *riparia*, iii. 49.
—— *schlechtendalii*, iii. 54.
—— *seemanniana*, iii. 45.
—— *septuplinervia*, iii. 55.
—— *sororia*, iii. 55.
—— *trinervis*, iii. 56.
—— *tuberculata*, iii. 56.
—— *ulmifolia*, iii. 48.
—— *urostachya*, iii. 57.
—— *verbascifolia*, iii. 57.
ARTEMISIA, ii. 230.
Artemisia, iv. 63.
—— *indica*, γ. *mexicana*, iv. 63.
—— klotzschiana, iv. 63.
—— mexicana, ii. 231; iv. 63.
Arthrocnemum fruticosum, iii. 26.
—— *macrostachyum*, iii. 26.
ARTHROSTEMMA, i. 417.
Arthrostemma, i. 420.
Arthrostemma campanulare, i. 417.
—— *exiguum*, i. 417.
—— fragile, i. 417.
—— *ladanoides*, i. 418.
ARTHROSTYLIDIUM, iii. 586.
Arthrostylidium racemiflorum, iii. 586.
ARTOCARPEÆ, iii. 143.
Artocarpus incisa, iii. 149.
Arum auritum, iii. 423.
—— *dracontium*, iii. 417.
—— *helleborifolium*, iii. 418.
—— *sagittifolium*, iii. 419.
—— *tripartitum*, iii. 423.
ARUNDINARIA, iii. 586.
Arundinaria, iv. 149, 299.
Arundinaria acuminata, iii. 586.

Arundinaria acuminata, iv. 262.
—— longifolia, iii. 586.
ARUNDINELLA, iii. 515.
Arundinella auletica, iii. 515.
—— *brasiliensis,* iii. 515, 516.
—— deppeana, iii. 515.
—— *latifolia,* iii. 515.
—— *martinicensis,* iii. 515.
—— pallida, iii. 515.
—— *pallida,* iii. 516.
—— *phragmitoides,* iii. 515.
—— *robusta,* iii. 515.
—— *scoparia,* iii. 515.
ARUNDO, iii. 571.
Arundo donax, iii. 571.
—— *occidentalis,* iii. 572.
—— *phragmitis,* iii. 571.
—— *quitensis,* iii. 539.
—— *saccharoides,* iii. 571.
—— *sagittata,* iii. 571.
—— *tenella,* iii. 543.
—— *tenuifolia,* iii. 543.
Asagræa caracasana, iii. 383.
—— *caricifolia,* iii. 383.
—— *officinalis,* iii. 383.
—— *spinosa,* i. 247.
—— *tenuifolia,* ii. 383.
ASCHENBORNIA, ii. 80.
Aschenbornia heteropoda, ii. 80.
ASCLEPIADACEÆ, iv. 104.
ASCLEPIADEÆ, ii. 318; iv. 68.
Asclepiadeæ, iv. 187, 202, 215, 217, 225, 231, 254.
ASCLEPIAS, ii. 322.
Asclepias, iv. 213, 231, 254.
Asclepias alticola, iv. 68.
—— *amœna,* ii. 325.
—— angustifolia, ii. 322.
—— auriculata, ii. 322.
—— bidentata, ii. 322.
—— brachystephana, ii. 323.
—— *brevicornu,* ii. 321.
—— coulteri, ii. 323.
—— curassavica, ii. 323; iv. 104, 113.
—— elata, ii. 323.
—— *elata,* iv. 68.
—— erosa, ii. 323.
—— euphorbiæfolia, ii. 323.
—— *fasciculata,* ii. 324.
—— *fœtida,* ii. 329.
—— fragrans, ii. 323.
—— *galeottii,* iv. 68.
—— *galioides,* ii. 327.
—— glaucescens, ii. 323; iv. 68.
—— grandiflora, iv. 69.
—— involucrata, ii. 323.
Asclepias jamesii, ii. 324.
—— lanuginosa, ii. 324.
—— laxiflora, ii. 324.
—— lemmoni, iv. 69.
—— linaria, ii. 324.
—— *lindheimeri,* ii. 324.
—— *linifolia,* ii. 322, 327.
—— longicornu, ii. 324.
—— *longipetala,* ii. 321.
—— *macrocera,* ii. 324.
—— *macrophylla,* ii. 324.
—— macrotis, ii. 324.
—— melantha, ii. 324.
—— *melantha,* iv. 290.
—— mexicana, ii. 324.
—— neglecta, ii. 325.
—— nivea, ii. 325.
—— *nivea,* iv. 69.
—— nummularia, ii. 325.
—— *œnotheroides,* ii. 324.
—— otarioides, iv. 69.
—— ovata, ii. 325.
—— pellucida, iv. 69.
—— perennis, var. parvula, iv. 69.
—— *phytolaccoides,* ii. 326.
—— pratensis, ii. 325.
—— puberula, ii. 325.
—— *purpurascens,* ii. 326.
—— quinquedentata, ii. 326.
—— rosea, ii. 326.
—— *rubra,* ii. 326.
—— rubricaulis, ii. 326.
—— schaffneri, ii. 326.
—— setosa, ii. 326.
—— similis, ii. 326.
—— subulata, ii. 326.
—— uncialis, ii. 327.
—— verticillata, ii. 327.
—— *verticillata,* var. *linifolia,* ii. 322.
—— *virgata,* ii. 322.
—— *viridis,* ii. 321.
—— virletii, iv. 69.
—— wrightii, ii. 327.
ASCLEPIODORA, ii. 321.
Asclepiodora, iv. 68.
Asclepiodora decumbens, ii. 321.
—— viridis, ii. 321.
ASCYRUM, i. 82.
Ascyrum crux-andreæ, i. 82.
—— hypericoides, i. 82.
ASEMNANTHA, ii. 44.
Asemnantha, ii. 44.
Asemnantha pubescens, ii. 44.
ASIMINA, i. 15.
Asimina, i. 17; iv. 96, 309.
Asimina campechiana, i. 15.
—— insularis, iv. 96.
Asimina triloba, iv. 96.
ASPARAGEÆ, iii. 367.
Asparagus, iii. 367.
ASPASIA, iii. 273.
Aspasia epidendroides, iii. 273.
—— *fragrans,* iii. 273.
—— papilionacea, iii. 273.
—— principissa, iii. 273.
ASPHODELEÆ, iii. 374.
ASPICARPA, i. 157.
Aspicarpa hartwegiana, i. 157; iv. 16.
—— *hirtella,* i. 157.
—— hyssopifolia, iv. 17.
—— *hyssopifolia,* iv. 140.
—— longipes, i. 157; iv. 17.
—— urens, i. 157.
ASPIDIEÆ, iii. 641.
ASPIDISTREÆ, iii. 369.
ASPIDIUM, iii. 641; iv. 148, 149.
Aspidium abruptum, iii. 649.
—— aculeatum, iii. 642.
—— *aculeatum,* iii. 667.
—— *agatholepis,* iii. 650.
—— *albicaule,* iii. 649.
—— *amplificatum,* iii. 642.
—— *amplum,* iii. 644.
—— *apertum,* iii. 649.
—— *athyrioides,* iii. 650.
—— augescens, iii. 652.
—— *bourgæi,* iii. 644.
—— *caripense,* iii. 645.
—— *cheiloplotium,* iii. 642.
—— *chontalense,* iii. 645.
—— *cicutarium,* iii. 645.
—— *confertum,* iii. 643.
—— *conspersoides,* iii. 649.
—— *conterminum,* iii. 645.
—— *crinitum,* iii. 642, 647.
—— *cumingianum,* iii. 646.
—— *deltoideum,* iii. 645.
—— *denticulatum,* iii. 646.
—— *distans,* iii. 642.
—— equestre, iii. 595.
—— *equestre,* iii. 644.
—— *exaltatum,* iii. 653.
—— *excelsum,* iii. 644.
—— *expansum,* iii. 651.
—— *exsudans,* iii. 645.
—— ——, *a. genuinum,* iii. 645.
—— ——, *β. majus,* iii. 645.
—— ——, *γ. feei,* iii. 645.
—— ——, *δ. myriocarpum,* iii. 645.
—— *extensum,* iii. 651.
—— *filix-mas,* iii. 646: iv. 149.
—— *flaccidum,* iii. 647.
—— *fragile,* iii. 605; iv. 150.

Aspidium francoanum, iii. 650.
—— *fumarioides*, iii. 605.
—— *geropogon*, iii. 649.
—— *ghiesbreghti*, iii. 646.
—— *gongylodes*, iii. 651.
—— *hartwegii*, iii. 642.
—— *heracleifolium*, iii. 643; iv. 300.
—— *imbricatum*, iii. 644, 651.
—— ——, var. *glabrescens*, iii. 651.
—— *indecorum*, iii. 649.
—— *inquinans*, iii. 649.
—— *jucundum*, iii. 646.
—— juglandifolium, iii. 642; iv. 116.
—— *karwinskyanum*, iii. 647.
—— *klotzschii*, iii. 646.
—— *kunzei*, iii. 651.
—— *lætum*, iii. 646.
—— *latifolium*, iii. 645.
—— *leptorrhachis*, iii. 649.
—— *levyi*, iii. 647.
—— *lindeni*, iii. 643, 648.
—— *lugubre*, iii. 649.
—— *macrophyllum*, iii. 648.
—— *macrourum*, iii. 649, 650.
—— melanostictnm, iii. 643.
—— *meniscoides*, iii. 643.
—— *mexicanum*, iii. 649.
—— ——, var. *a.* obtusilobum, iii. 649.
—— ——, var. *β. acutilobum*, iii. 649.
—— microcarpon, iii. 652.
—— *microchlæna*, iii. 652.
—— *molle*, iii. 648.
—— *molliculum*, iii. 645.
—— ——, *β. majus*, iii. 645.
—— ——, *γ. cheilanthoides*, iii. 645.
—— *mülleri*, iii. 642.
—— *muricatum*, iii. 642.
—— nemophilum, iii. 642.
—— nicaraguense, iii. 643.
—— *nobile*, iii. 642.
—— obtusilobum, iii. 652.
—— *oligocarpum*, iii. 645.
—— *ordinatum*, iii. 642.
—— orizabæ, iii. 652.
—— *paleaceum*, iii. 646.
—— *pallidum*, iii. 648.
—— *parallelogrammum*, iii. 647.
—— *patens*, iii. 649.
—— *paupertinum*, iii. 649.
—— *pectinatum*, iii. 652.
—— *pœppigii*, iii. 648.
—— *producens*, iii. 676.
—— *pseudo-filix-mas*, iii. 647.
—— *puberulum*, iii. 649.
Aspidium pumilum, iii. 642, 643.
—— *remotispora*, iii. 643.
—— *reptans*, iii. 668.
—— *rhachichlæna*, iii. 642.
—— *rigidum*, var. *argutum*, iii. 649.
—— *roseum*, iii. 649.
—— *schaffneri*, iii. 650.
—— *seemanni*, iii. 643.
—— semicordatum, iii. 643.
—— *serra*, iv. 300.
—— *sprengelii*, iii. 650.
—— *tetragonum*, iii. 650, 651.
—— *trianæ*, iii. 651.
—— trifoliatum, iii. 643; iv. 116.
—— *vanheurckii*, iii. 651.
—— *vestitum*, iii. 642.
—— *violascens*, iii. 648.
ASPIDOSPERMA, ii. 308.
Aspidosperma megalocarpon, ii. 308.
ASPILIA, ii. 171.
Aspilia, iv. 231.
Aspilia mexicana, ii. 171.
—— strigosa, ii. 171.
ASPLENIEÆ, iii. 629.
ASPLENIUM, iii. 629.
Asplenium, iv. 149, 213, 281.
Asplenium abscissum, iii. 629; iv. 116.
—— achilleæfolium, iii. 629.
—— *achilleæfolium*, iii. 629.
—— *amabile*, iii. 638.
—— *ambiguum*, iii. 637.
—— *amplum*, iii. 632.
—— anisophyllum, iii. 630; iv. 116.
—— *anthriscifolium*, iii. 637.
—— arboreum, iii. 630.
—— *arboreum*, iii. 639.
—— arcuatum, iii. 630.
—— *aspidiiforme*, iii. 639.
—— *athyrioides*, iii. 629.
—— auriculatum, iii. 630; iv. 116.
—— *auriculatum*, iii. 639.
—— auritum, iii. 630; iv. 116.
—— *auritum*, iii. 631.
—— ——, *α. obscurum*, iii. 630.
—— ——, *β. monodon*, iii. 630.
—— ——, *γ. bipinnatisectum*, iii. 630.
—— ——, *δ. dissectum*, iii. 630.
—— ——, *ε. tripinnatum*, iii. 630.
—— ——, *ζ. fœniculaceum*, iii. 630.
—— *bicrenatum*, iii. 630.
—— *bipinnatisectum*, iii. 631.
—— bisectum, iii. 631.
—— *bourgæi*, iii. 633.
—— bulbiferum, iii. 631; iv. 116.
—— *bulbiferum*, iii. 640.
Asplenium callipteris, iii. 631.
—— caripense, iii. 632.
—— *castaneum*, iii. 640.
—— *cuneatum*, var. *caripense*, iii. 632.
—— cicutarium, iii. 632; iv. 116.
—— coriaceum, iii. 632.
—— *corifolium*, iii. 630.
—— costale, iii. 632.
—— crenulatum, iii. 632.
—— cultrifolium, iii. 632.
—— *curvatum*, iii. 630.
—— *densum*, iii. 640.
—— dentatum, iii. 632.
—— *denticulosum*, iii. 639.
—— *discolor*, iii. 630.
—— *dissectum*, iii. 632.
—— distans, iii. 633.
—— divaricatum, iii. 633.
—— *dombeyi*, iii. 633.
—— *dubium*, iii. 637.
—— *ensiforme*, iii. 632.
—— *erectum*, iii. 636, 640.
—— ——, *β. harpeodes*, iii. 636.
—— *expansum*, iii. 632.
—— *falcatum*, iii. 636.
—— *feei*, iii. 630.
—— filix-fœmina, iii. 633.
—— *filix-fœmina*, iv. 298.
—— *firmum*, iii. 629.
—— *fissum*, iii. 632.
—— *flabellulatum*, iii. 638.
—— *fœniculaceum*, iii. 631.
—— formosum, iii. 633.
—— fournieri, iii. 634.
—— fragile, iii. 634.
—— *fragrans*, iii. 631.
—— franconis, iii. 634.
—— *franconis*, *β. gracile*, iii. 634.
—— *fraternum*, iii. 635.
—— furcatum, iii. 634.
—— *galeottii*, iii. 633, 636.
—— ghiesbreghtii, iii. 634.
—— gracile, iii. 634.
—— *grande*, iii. 629, 630.
—— grandifolium, iii. 634.
—— hahnii, iii. 635.
—— *harpeodes*, iii. 636.
—— harrisoni, iii. 635.
—— hastatum, iii. 635.
—— *heterochroum*, iii. 640.
—— *inæquilaterale*, iii. 636, 639.
—— *insigne*, iii. 638.
—— kunzei, iii. 635.
—— lacerum, iii. 635.
—— lætum, iii. 635.
—— lamprocaulon, iii. 635.

Asplenium laserpitiifolium, iii. 634.
—— *laxum*, iii. 631.
—— *leptophyllum*, iii. 636.
—— levyi, iii. 635.
—— lindbergii, iii. 635; iv. 116.
—— *lugubre*, iii. 635.
—— lunulatum, iii. 636; iv. 116.
—— *lunulatum*, γ. *latius*, iii. 636.
—— *macrocarpum*, iii. 631.
—— macrotis, iii. 636.
—— marginatum, iii. 636.
—— *martensii*, iii. 633.
—— *melanocaulon*, iii. 640.
—— *mexicanum*, iii. 631.
—— *michauxii*, iii. 633.
—— minimum, iii. 637.
—— *miradorense*, iii. 635.
—— monanthemum, iii. 636; iv. 116.
—— *monanthemum*, iv. 298.
—— *monodon*, iii. 630, 631.
—— moritzianum, var. depauperatum, iii. 636.
—— *myapteron*, iii. 631.
—— *myriophyllum*, iii. 638.
—— *nanum*, iii. 635.
—— neglectum, iv. 116.
—— *nidus*, iii. 639.
—— nigricans, iii. 636.
—— *nigricans*, iii. 634.
—— *nigripes*, iii. 641.
—— obesum, iii. 637.
—— obtusifolium, iii. 637.
—— *obtusissimum*, iii. 630.
—— *parvulum*, iii. 640.
—— *pendulum*, iii. 636.
—— *petroselinum*, iii. 631.
—— *pimpinellifolium*, iii. 630.
—— plantagineum, iii. 637.
—— *polymorphum*, iii. 629, 633.
—— *præmorsum*, iii. 634.
—— progrediens, iii. 638.
—— pumilum, iii. 637.
—— *pyramidatum*, iii. 630.
—— radicans, iii. 637; iv. 116.
—— *recognitum*, iii. 631.
—— *repandulum*, iii. 637.
—— *resiliens*, iii. 640.
—— *resupinum*, iii. 636.
—— rhizophorum, iii. 638.
—— *rhizophorum*, iii. 640.
—— rhizophyllum, iii. 638.
—— *rigidum*, iii. 631.
—— *riparium*, iii. 637.
—— rutaceum, iii. 638.
—— salicifolium, iii. 638.
—— *salicifolium*, iii. 629.
Asplenium sanguinolentum, iii, 630.
—— schaffneri, iii. 638.
—— *schiedei*, iii. 639.
—— *schkuhriana*, iii. 635.
—— *schottii*, iii. 631.
—— *semicordatum*, iii. 630, 635.
—— serra, iii. 638; iv. 116.
—— serratum, iii. 639; iv. 116.
—— *serratum*, var. *latius*, iii. 639.
—— sessilifolium, iii. 639.
—— shepherdi, iii. 639.
—— skinneri, iii. 639.
—— solmsii, iii. 639.
—— *subalatum*, iii. 633.
—— *sulcatum*, iii. 631.
—— sylvaticum, iii. 640.
—— ternatum, iii. 640.
—— *theciferum*, iii. 605.
—— trichomanes, iii. 640.
—— *trichomanes*, iv. 298.
—— trichomanoides, iii. 640.
—— triphyllum, iii. 639.
—— *verecundum*, iii. 638.
ASTER, ii. 120.
Aster, iv. 148, 166, 213, 252.
—— *americanus*, iv. 60.
—— asperrimus, ii. 120.
—— *aurantius*, iv. 60.
—— canescens, ii. 120.
—— *caricifolius*, ii. 122.
—— carnosus, ii. 120.
—— divaricatus, ii. 121; iv. 53.
—— ehrenbergii, ii. 121.
—— *ehrenbergii*, ii. 122.
—— ericæfolius, ii. 121.
—— gracilis, ii. 122.
—— gymnocephalus, ii. 121.
—— *hebecladus*, ii. 122.
—— incanus, ii. 121.
—— inconspicuus, ii. 121.
—— jamaicensis, ii. 121.
—— lima, ii. 121.
—— *lima*, ii. 122.
—— lindeni, ii. 122.
—— *maximus*, ii. 124.
—— moranensis, ii. 122.
—— *moranensis*, iv. 288.
—— multiflorus, ii. 122.
—— parviflorus, ii. 122.
—— pauciflorus, ii. 122.
—— *pinnatus*, ii. 219.
—— potosinus, ii. 122.
—— purpurascens, ii. 122.
—— riparius, ii. 122.
—— *rivularis*, ii. 125; iv. 149.
—— scaberrimus, ii. 123.
—— *scoparius*, ii. 122.
Aster simplex, ii. 123.
—— *sonoræ*, ii. 122.
—— spinosus, ii. 123.
—— *spinosus*, iv. 141.
—— *sutureiæfolius*, ii. 226.
ASTERISCIUM, i. 559.
Asteriscium flexuosum, i. 559; iv. 248.
ASTEROGYNE, iii. 409.
Asterogyne, iv. 276.
Asterogyne martiana, iii. 409.
ASTEROIDEÆ, ii. 109.
Asteroideæ, iv. 183.
Astianthus longifolius, ii. 497.
Astræa seemanni, iii. 114.
ASTRAGALUS, i. 263.
Astragalus, iv. 213.
Astragalus antoninus, iv. 28.
—— arizonicus, iv. 28.
—— bigelowii, i. 263.
—— brevidentatus, i. 266.
—— cobrensis, i. 263.
—— coriaceus, i. 263.
—— diphacus, iv. 28.
—— ervoides, i. 264.
—— glareosus, i. 264.
—— gracilis, i. 266.
—— greggii, iv. 28.
—— guatemalensis, i. 264.
—— *guatemalensis*, iv. 284.
—— hartwegii, i. 264; iv. 28.
—— helleri, i. 264; iv. 28.
—— *helleri*, iv. 284.
—— humboldtii, i. 264.
—— hypoleucus, i. 265.
—— leptocarpus, i. 265.
—— mexicanus, i. 265.
—— mollissimus, i. 265.
—— nothoxys, i. 265.
—— nuttallianus, i. 265.
—— orthanthus, i. 265; iv. 28.
—— oxyrhynchus, i. 265.
—— parvus, i. 266; iv. 28.
—— reptans, i. 266.
—— *reptans*, i. 264.
—— sonoræ, i. 266.
—— *sonoræ*, iv. 28.
—— strigulosus, i. 266.
—— *strigulosus*, iv. 284.
—— thurberi, i. 266.
—— *trichocalyx*, i. 265.
—— triflorus, i. 266.
—— vaccarum, i. 267.
—— *vaccarum*, iv. 28.
Astrephia mexicana, ii. 67, 69; iv. 48.
—— *pratensis*, ii. 67.
ASTROCARYUM, iii. 414.

Astrocaryum, iv. 277.
Astrocaryum mexicanum, iii. 414.
—— polystachyum, iii. 414.
Astrogyne crotonoides, iii. 112.
ASTROPHYLLUM, i. 168.
Astrophyllum dumosum, i. 168; iv. 17.
Astrophytum myriostigma, i. 535.
ATAMISQUEA, iv. 7.
Atamisquea emarginata, iv. 7.
Ataxia mexicana, iii. 532.
ATELEIA, i. 321.
Ateleia pterocarpa, i. 321.
ATHENÆA, ii. 422.
Athenæa xalapensis, ii. 422.
ATHEROPOGON, iii. 564.
Atheropogon, iii. 560.
Atheropogon acuminatus, iii. 564.
—— *americanus*, iii. 561.
—— *apludioides*, iii. 563.
—— *aristidioides*, iii. 561.
—— *bromoides*, iii. 561.
—— *curtipendulus*, iii. 563.
—— filiformis, iii. 564.
—— *gracilis*, iii. 562.
—— *juncifolius*, iii. 561.
—— medius, iii. 564.
—— *oligostachyus*, iii. 562.
—— polymorphus, iii. 564.
—— *radicosus*, iii. 561.
—— *repens*, iii. 561.
—— *scorpioides*, iii. 563.
—— stolonifer, iii. 565.
—— *stolonifer*, iv. 297.
—— *triæna*, iii. 564.
Athyrium alchillesæfolium, iii. 629.
—— *bourgæi*, iii. 633.
—— *conchatum*, iii. 629.
—— filix-fœmina, iii. 633.
—— *galeotti*, iii. 633.
—— gracile, iii. 634.
—— *grande*, iii. 629.
—— *macrocarpum*, iii. 631.
—— *martensii*, iii. 633.
—— *michauxii*, iii. 633.
—— *moritzianum*, iii. 636.
—— skinneri, iii. 639.
—— *skinneri*, iii. 639.
—— *sphærocarpum*, iii. 650.
ATHYROCARPUS, iii. 386.
Athyrocarpus leiocarpus, iii. 386.
—— persicariæfolius, iii. 386.
ATRIPLEX, iii. 24.
Atriplex acanthocarpa, iii. 24.
—— arenaria, iii. 24.
—— *berlandieri*, iii. 24.
—— canescens, iii. 24.
Atriplex confertifolia, iii. 25.
—— cristata, iv. 114.
—— elegans, iii. 24.
—— greggii, iii. 25.
—— hymenelytra, iii. 25.
—— linifolia, iii. 25.
—— muricata, iii. 25.
—— obovata, iii. 25.
—— *occidentalis*, iii. 24.
—— oppositifolia, iii. 25.
—— parvifolia, iii. 25.
—— polygama, iii. 25.
—— spinosa, iii. 25.
ATROCARPEÆ, iii. 143.
ATTALEA, iii. 415.
Attalea, iv. 276.
Attalea cohune, iii. 415.
—— *cohune*, iv. 152.
—— rostrata, iii. 415.
Aubletia, i. 141.
Aubrya, iv. 207.
Augustinea balanoidea, iii. 412.
—— *ovata*, iii. 413.
Aulacophyllum, iii. 193.
—— *ortgiesi*, iii. 194.
—— *roezli*, iii. 193.
—— *skinneri*, iii. 193.
Auliza ciliaris, iii. 228.
AURANTIEÆ, i. 171.
AVENA, iii. 556.
Avena, iv. 151.
—— *deyeuxioides*, iii. 554.
—— *elongata*, iii. 555.
—— *fatua*, iii. 556.
—— *mollis*, iii. 556.
—— *sterilis*, iii. 556.
—— *tolucensis*, iii. 556.
—— *trichopodia*, iii. 556.
—— *viridis*, iii. 555.
AVENEÆ, iii. 555.
AVERRHOA, i. 165.
Averrhoa bilimbi, i. 166.
AVICENNIA, ii. 540.
Avicennia, iv. 161, 165.
Avicennia nitida, iv. 113.
—— tomentosa, ii. 540; iv. 107.
AXINIPHYLLUM, ii. 158.
Axiniphyllum corymbosum, ii. 158.
—— tomentosum, ii. 158.
AYENIA, i. 134.
Ayenia, iv. 237.
Ayenia cordifolia, i. 134.
—— magna, i. 134.
—— *microphylla*, i. 135.
—— microphylla, i. 134; iv. 15.
—— ovata, i. 134.
—— *parvifolia*, iv. 141.
Ayenia pusilla, i. 135.
—— *pusilla*, i. 134.
—— rotundifolia, i. 135.
—— sidæfolia, i. 135.
AZARA, i. 56.
Azara umbellata, i. 56.
AZOLLA, iii. 710.
Azolla caroliniana, iii. 437.
—— caroliniana, iii. 710.
—— *filiculoides*, iii. 710.
—— *mexicana*, iii. 710.

BACCHARIS, ii. 128.
Baccharis, ii. 129; iv. 148, 149, 213, 252.
Baccharis alamani, ii. 128.
—— angustifolia, ii. 128; iv. 53.
—— *asperifolia*, ii. 126.
—— asperula, ii. 128.
—— bigelovii, ii. 128; iv. 53.
—— brachyphylla, ii. 128.
—— cærulescens, ii. 128.
—— conferta, ii. 128.
—— *conferta*, iv. 288.
—— congesta, ii. 128.
—— *cuneata*, ii. 128.
—— divergens, ii. 128.
—— elegans, ii. 129.
—— emoryi, ii. 129.
—— hænkei, ii. 129.
—— heterophylla, ii. 129.
—— *heterophylla*, iv. 288.
—— hieraciifolia, ii. 129.
—— hirtella, ii. 129.
—— *jalapensis*, iv. 149.
—— lancifolia, ii. 129.
—— linifolia, ii. 130.
—— longifolia, ii. 130.
—— micrantha, ii. 130.
—— mucronata, ii. 130.
—— multiflora, ii. 130.
—— *multiflora*, iv. 288.
—— nervosa, ii. 130.
—— orizabaensis, ii. 130.
—— parviflora, ii. 130.
—— polygalæfolia, ii. 130.
—— *polygalæfolia*, iv. 288.
—— potosina, ii. 130.
—— ptarmicæfolia, ii. 130.
—— pteronioides, ii. 131; iv. 53.
—— pyrrhopappa, ii. 132.
—— ramiflora, ii. 131.
—— ramulosa, ii. 131.
—— *ramulosa*, iv. 53.
—— rhexioides, ii. 131.
—— *salicina*, iv. 141.
—— scandens, ii. 131.

Baccharis seemanni, ii. 131.
—— seemannii, ii. 129.
—— sergiloides, ii. 131.
—— serræfolia, ii. 131.
—— serratifolia, ii. 131.
—— sordescens, ii. 132.
—— spathulata, ii. 132.
—— squarrosa, ii. 132.
—— sulcata, ii. 132.
—— texana, ii. 132.
—— thesioides, ii. 132.
—— *thesioides*, iv. 288.
—— thomasii, iv. 53.
—— trichoclada, ii. 132.
—— vaccinioides, ii. 132.
—— *veneta*, ii. 115.
—— wrightii, ii. 132.
—— *wrightii*, ii. 131.
—— *xalapensis*, ii. 128.
BACTRIS, iii. 412.
Bactris, iv. 152, 276, 277.
Bactris baculifera, iii. 412.
—— balanoidea, iii. 412.
—— *bifida*, iii. 413.
—— caudata, iii. 412.
—— cohune, iv. 92.
—— fusca, iii. 412.
—— *glandulosa*, iii. 413.
—— horrida, iii. 412.
—— longepetiolata, iii. 412.
—— mexicana, iii. 413.
—— minor, iii. 413.
—— œrstedii, iii. 413.
—— ovata, iii. 413.
—— polystachya, iii. 413.
—— subglobosa, iii. 413.
—— *subglobosa*, iv. 165.
—— utilis, iii. 413.
—— villosa, iii. 413.
Badula caribæa, ii. 292.
BAHIA, ii. 211.
Bahia absinthifolia, ii. 211; iv. 58.
—— ——, var. dealbata, iv. 59.
—— *absinthifolia*, iv. 141.
—— anthemoides, ii. 212.
—— *anthemoides*, iv. 588.
—— *biternata*, ii. 212.
—— dealbata, ii. 212.
—— *nepetæfolia*, ii. 212.
—— sinuata, ii. 212.
—— stœchadifolia, ii. 212.
—— trolliifolia, ii. 212.
BAILEYA, ii. 229.
Baileya multiradiata, ii. 230.
—— *multiradiata*, iv. 141.
—— pauciradiata, ii. 230.
—— pleniradiata, ii. 230.
Baillieria aspera, ii. 142.
BALANOPHOREÆ, iii. 87.
Balanophoreæ, iv. 192, 205, 215, 217.
Balanopseæ, iii. 137; iv. 193.
Ballota suaveolens, ii. 545.
BALSAMINEÆ, i. 166.
Balsamona leptopoda, i. 443.
BALTIMORA, ii. 144.
Baltimora panamensis, ii. 144.
—— recta, ii. 144.
—— scolopospermum, ii. 144; iv. 54.
BAMBUSA, iii. 588.
Bambusa amplexifolia, iii. 587.
—— *latifolia*, iii. 588.
—— vulgaris, iii. 588.
BAMBUSEÆ, iii. 586.
BANARA, i. 470.
Banara dioica, i. 470.
—— ibaguensis, i. 470.
—— mexicana, i. 471.
—— mollis, i. 471.
BANAREÆ, i. 470.
BANISTERIA, i. 152.
Banisteria, iv. 262.
Banisteria angustifolia, i. 153.
—— argentea, i. 152.
—— billbergiana, i. 152.
—— *bracteata*, i. 154.
—— *brevipes*, i. 156.
—— *elliptica*, i. 151.
—— ferruginea, i. 153.
—— *ferruginea*, i. 154.
—— *laurifolia*, i. 150.
—— maracaybensis, i. 153.
—— *mucronata*, i. 151.
—— *paniculata*, i. 150.
—— *periplocifolia*, i. 152.
—— *picta*, i. 151.
—— schomburgkiana, i. 153.
—— *ternata*, i. 151.
—— *tiliæfolia*, i. 152.
BANISTERIEÆ, i. 150.
BARBAREA, i. 29.
Barbarea, iv. 150.
Barbarea vulgaris, i. 30.
BARBIERIA, i. 256.
Barbieria polyphylla, i. 256.
Barcena guanajuatensis, iv. 22.
Barhamia hispida, iii. 116.
—— *panamensis*, iii. 116.
Barkeria, iii. 243.
Barkeria elegans, iii. 230.
—— *lindleyana*, iii. 233; iv. 302.
—— *melanocaulon*, iii. 234.
—— *skinneri*, iv. 302.
Barkeria skinneri major, iii. 240.
—— *spectabilis*, iii. 240.
BARLERIA, ii. 509.
Barleria discolor, ii. 510.
—— micans, ii. 510.
Barleriopsis discolor, ii. 510.
—— *glandulosa*, ii. 510.
—— *micans*, ii. 510.
Barrattia ghiesbreghtii, ii. 184.
BARROETEA, ii. 102.
Barroetea setosa, ii. 102.
—— subuligera, ii. 102; iv. 51.
BARTLETTIA, ii. 234.
Bartlettia scaposa, ii. 234.
Bartramia, iv. 149.
—— *uncinata*, iv. 150.
BARTSIA, ii. 464.
Bartsia laticrenata, ii. 464.
—— santolinæfolia, ii. 464.
BASANACANTHA, ii. 39.
Basanacantha monantha, ii. 39.
—— ? reticulata, iv. 47.
Basella vesicaria, iii. 28.
BASSOVIA, ii. 422.
Bassovia lucida, ii. 422.
BASTARDIA, i. 107.
Bastardia hirsutiflora, i. 107.
—— viscosa, i. 107; iv. 14.
Batatas, iv. 256.
—— *acetosæfolia*, ii. 385.
—— *bombycina*, ii. 384.
—— *cissoides*, ii. 385.
—— *edulis*, ii. 384.
—— *heterophylla*, ii. 388.
—— *jalapa*, ii. 388.
—— *littoralis*, ii. 385.
—— *paniculuta*, ii. 386.
—— *pentaphylla*, ii. 392.
—— *quinyuefolia*, ii. 393.
—— wallii, ii. 396.
—— *willdenowii*, ii. 388.
Batemania burtii, iii. 251.
—— *grandiflora*, iii. 251.
Bathmium heracleifolium, iii. 643.
—— *macrophyllum*, iii. 648.
—— *nicaraguense*, iii. 643.
—— *pœppigii*, iii. 648.
—— *trifoliatum*, iii. 643.
BATIDEÆ, iii. 31.
Batideæ, iv. 190.
Batis maritima, iii. 31.
BAUCHEA, iii. 550.
Bauchea, iv. 279.
Bauchea karwinskii, iii. 550.
BAUHINIA, i. 336.
Bauhinia, iv. 112.
—— andrieuxii, i. 336.

Bauhinia columbiensis, i. 336.
—— dipetala, i. 337.
—— excisa, i. 337.
—— *grandiflora*, iv. 112.
—— heterophylla, i. 337.
—— hymenææfolia, i. 337.
—— inermis, i. 337 ; iv. 32.
—— latifolia, i. 338.
—— leptopetala, i. 338.
—— lunaria, i. 338.
—— macranthera, i. 338.
—— mexicana, i. 338.
—— *panamensis*, i. 338.
—— *parvifolia*, i. 338.
—— pauletia, i. 338.
—— pes-capræ, i. 338.
—— platypetala, i. 339.
—— porrecta, i. 339 ; iv. 99, 112.
—— ramosissima, i. 339 ; iv. 32.
—— schlechtendaliana, i. 339.
—— spathacea, i. 339.
—— splendens, i. 340.
—— suaveolens, i. 340.
—— subrotundifolia, i. 340.
—— unguicularis, i. 340.
BAUHINIEÆ, i. 336.
Baziasa, ii. 160.
Bdallophytum andrieuxii, iii. 41.
—— *ceratantherum*, iii. 40.
Beatonia atrata, iii. 326.
—— *curvata*, iii. 326.
—— *purpurea*, iii. 327.
Beaucarnea, iii. 371.
—— *gracilis*, iii. 372.
—— *hartwegiana*, iii. 371.
—— *hookeri*, iii. 373.
—— *humilis*, iii. 372.
—— *lindheimeriana*, iii. 372.
—— *longifolia*, iii. 372.
—— *parviflora*, iii. 372.
—— *recurvata*, iii. 372.
—— *stricta*, iii. 372.
—— *watsoni*, iii. 372.
Beautempsia, i. 44.
Becquerelia, iii. 468.
—— *glomerulata*, iii. 468.
Befaria, ii. 282.
BEGONIA, i. 493.
Begonia, iv. 202, 243, 245, 299, 301, 302.
Begonia acutiloba, i. 493.
—— angustifolia, i. 493.
—— annulata, i. 496.
—— anodæfolia, i. 493.
—— *anodæfolia*, iv. 286.
—— asarifolia, i. 496.
—— balmisiana, i. 493.
Begonia barkeri, i. 494.
—— biserrata, i. 494.
—— boissieri, i. 494.
—— broussonnetiæfolia, i. 494.
—— bulbillifera, i. 494.
—— cardiocarpa, i. 494.
—— caroliniæfolia, i. 494.
—— carpinifolia, i. 494.
—— conchæfolia, i. 494.
—— crassicaulis, i. 494.
—— crenatifolia, i. 494.
—— *dædalea*, i. 499.
—— dealbata, i. 494.
—— decandra, i. 494.
—— *dentata*, i. 493.
—— depauperata, i. 495.
—— diversifolia, i. 496.
—— donkelaariana, i. 495.
—— *elliptica*, i. 499.
—— falciloba, i. 495.
—— *falciloba*, i. 500.
—— filipes, i. 495.
—— fimbriata, i. 495.
—— flexuosa, i. 495.
—— franconis, i. 495.
—— fusca, i. 495.
—— *glabra*, i. 499.
—— *glabrata*, i. 495.
—— glandulosa, i. 495.
—— gracilis, i. 495.
—— heracleifolia, i. 496.
—— *hernandifolia*, i. 495.
—— humilis, i. 496.
—— *humilis*, i. 495.
—— hydrocotylifolia, i. 496.
—— ignea, i. 496.
—— imperialis, i. 496.
—— incana, i. 496.
—— incarnata, i. 496.
—— *insignis*, i. 496.
—— involucrata, i. 496.
—— jurgensenii, i. 498.
—— karwinskiana, i. 496.
—— laciniosa, i. 496.
—— *lepidota*, i. 497.
—— liebmanni, i. 497.
—— lindleyana, i. 497.
—— *lobata*, i. 498.
—— lobulata, i. 497.
—— locellata, i. 497.
—— longipes, i. 497.
—— longistipulacea, i. 498.
—— ludicra, i. 497.
—— manicata, i. 497.
—— martiana, i. 496.
—— *martiana*, iv. 148.
—— maxima, i. 497.
Begonia megaphylla, i. 497.
—— membranacea, i. 495.
—— mitellifolia, i. 494.
—— modesta, i. 497.
—— monophylla, i. 497.
—— monoptera, i. 497.
—— *moritziana*, i. 500.
—— multinervia, i. 498.
—— nelumbiifolia, i. 498.
—— nervipilosa, i. 495.
—— oaxacana, i. 498.
—— palmaris, i. 498.
—— *palmata*, i. 498.
—— *parviflora*, i. 495.
—— pedata, i. 498.
—— phyllomaniaca, i. 498.
—— *physalifolia*, i. 499.
—— pilifera, i. 498.
—— pilosula, i. 498.
—— pinetorum, i. 498.
—— plebeja, i. 498.
—— polygonata, i. 498.
—— *populifolia*, i. 493, 500.
—— pruinata, i. 498.
—— pustulata, i. 499.
—— *reniformis*, i. 497.
—— *repens*, i. 497.
—— reptans, i. 499.
—— rhizocaulis, i. 499.
—— rosea, i. 499.
—— *rotata*, i. 494.
—— sarcophylla, i. 499.
—— *sartorii*, i. 499.
—— scandens, i. 499.
—— *schizolepis*, i. 497.
—— *scutellata*, i. 494.
—— seemanniana, i. 499.
—— semiovata, i. 499.
—— sericoneura, i. 499.
—— setifera, i. 499.
—— setulosa, i. 499.
—— squarrosa, i. 499.
—— stigmosa, i. 499.
—— strigillosa, i. 499.
—— subhumilis, i. 500.
—— tovarensis, i. 500.
—— urophylla, i. 500.
—— *vitifolia*, i. 497.
BEGONIACEÆ, i. 493.
Begoniaceæ, iv. 181, 202, 245.
Begoniella, iv. 245.
BEILSCHMIEDIA, iii. 70.
Beilschmiedia pendula, iii. 70.
BEJARIA, ii. 282.
Bejaria, iv. 254, 302.
Bejaria discolor, ii. 282.
—— *floribunda*, ii. 282.

Bejaria glabra, ii. 282.
—— lævis, ii. 282.
—— mexicana, ii. 282.
BELLIS, ii. 118.
Bellis mexicana, ii. 118.
—— xanthocomoides, ii. 118.
BELLUCIA, i. 432.
Bellucia aubletii, i. 432.
—— macrophylla, i. 432.
—— *superba*, i. 432.
BELOPERONE, ii. 516.
Beloperone ciliata, ii. 518.
—— comosa, ii. 516.
—— fimbriata, ii. 516.
—— macrantha, ii. 516.
—— violacea, ii. 517.
Beloperonides macrantha, ii. 516.
BELOTIA, i. 136.
Belotia galeottii, i. 137.
—— grewiæfolia, i. 136.
—— *grewiæfolia*, i. 137.
—— insignis, i. 137.
—— *insignis*, i. 136.
Benthamia, ii. 379.
BERBEREÆ, i. 22.
BERBERIDEÆ, i. 22; iv. 3.
Berberideæ, iv. 171, 204, 224.
BERBERIS, i. 22.
Berberis, iv. 127.
Berberis andrieuxii, i. 23.
—— angustifolia, i. 23.
—— aquifolium, i. 23.
—— chococo, i. 23.
—— dealbata, i. 23.
—— ehrenbergii, i. 23.
—— *fasciculata*, i. 24.
—— fraxinifolia, i. 23.
—— fremontii, i. 23.
—— gracilis, i. 23; iv. 3.
—— hartwegii, i. 23.
—— ilicina, i. 23.
—— *ilicina*, iv. 3.
—— lanceolata, i. 23.
—— *lanceolata*, i. 24.
—— pallida, i. 23; iv. 3.
—— paniculata, i. 24.
—— *paniculata*, iv. 157, 282.
—— pinnata, i. 24.
—— schiedeana, i. 24; iv. 3.
—— tenuifolia, i. 24.
—— *tenuifolia*, iv. 301.
—— *trifoliata*, iv. 140.
—— trifoliolata, i. 24; iv. 3.
Berchtoldia, iii. 503.
—— *bromoides*, iii. 503.
—— *holciformis*, iii. 501.
—— *junciformis*, iii. 501.
Berchtoldia oplismenoides, iii. 501.
BERENDTIA, ii. 448.
Berendtia coulteri, ii. 448.
—— *ghiesbreghtii*, ii. 448.
—— rugosa, ii. 448.
BERGHESIA, ii. 6.
Berghesia coccinea, ii. 6.
BERGINIA, ii. 510.
Berginia virgata, ii. 510.
BERLANDIERA, ii. 147.
Berlandiera lyrata, ii. 147.
Berlasia emarginata, iii. 14.
BERNARDIA, iii. 121.
Bernardia (?) fasciculata, iv. 86.
—— genuina, iii. 121.
—— *intermedia*, iii. 121.
—— interrupta, iii. 121.
—— mexicana, iii. 121.
—— myricæfolia, iii. 122.
Bernhardia, iii. 703.
—— *antillarum*, iii. 703.
—— *californica*, iii. 703.
—— *complanata*, iii. 703.
—— *deppeana*, iii. 703.
—— *floridana*, iii. 703.
—— *indica*, iii. 703.
—— *mariana*, iii. 703.
—— *novæ-hollandiæ*, iii. 703.
—— *oahuensis*, iii. 703.
—— *ramulosa*, iii. 703.
—— *schiedeana*, iii. 703.
—— *zollingeri*, iii. 703.
BERNOULLIA, i. 128.
Bernoullia, iv. 237.
Bernouillia flammea, i. 128.
BERTIERA, ii. 37.
Bertiera, iv. 231, 249.
Bertiera angustifolia, ii. 37.
Bertolonia hirsuta, i. 422.
Berula angustifolia, i. 566.
BESCHORNERIA, iii. 338.
Beschorneria, iv. 272, 273, 309.
Beschorneria tonelii, iii. 338.
—— tubiflora, iii. 338.
—— yuccoides, iii. 338.
BESLERIA, ii. 488.
Besleria barbensis, ii. 488.
—— columneoides, ii. 488.
—— costaricensis, ii. 488.
—— cyrtanthemum, ii. 488.
—— deflexa, ii. 488.
—— glabra, ii. 488.
—— hirsuta, ii. 488.
—— *insignis*, ii. 481.
—— princeps, ii. 488.
—— *pulchella*, ii. 482.
—— *spectabilis*, ii. 483.
Besleria triflora, ii. 488.
—— wendlandiana, ii. 488.
BESSERA, iii. 377.
Bessera elegans, iii. 377.
—— *miniata*, iii. 377.
—— *multiflora*, iii. 377.
Beta vulgaris, iii. 24.
Betula, iv. 260.
—— *arguta*, iii. 165.
Betulaceæ, iv. 226.
BETULÆ, iii. 165.
Beurreria, ii. 369.
BICARPELLATÆ, ii. 303.
Bicuspidaria involucrata, iv. 38.
BIDENS, ii. 201.
Bidens, iv. 58, 149, 150, 213.
Bidens alausensis, ii. 201.
—— angustissima, ii. 201.
—— anthriscoides, ii. 201.
—— *arguta*, ii. 202.
—— bipinnata, ii. 201.
—— *bonplandii*, ii. 200.
—— brachycarpa, ii. 201.
—— canescens, ii. 201.
—— caucalidea, ii. 201.
—— *caudata*, ii. 199.
—— chrysanthemoides, ii. 201.
—— *coreopsidis*, ii. 203.
—— costaricensis, ii. 201.
—— *crocata*, ii. 187.
—— daucifolia, ii. 201.
—— decolorata, ii. 202.
—— *diversifolia*, ii. 199.
—— dondiæfolia, ii. 202.
—— exaristata, ii. 202.
—— ferulæfolia, ii. 202.
—— *ferulæfolia*, iv. 58.
—— fœniculifolia, ii. 202.
—— *fœniculifolia*, iv. 58.
—— *formosa*, ii. 199.
—— *gracilis*, ii. 198.
—— grandiflora, ii. 202.
—— helianthoides, ii. 202.
—— heterophylla, ii. 202; iv. 58.
—— hirtella, ii. 202.
—— *humboldtii*, ii. 199.
—— *kunthii*, ii. 199.
—— *leucantha*, ii. 203.
—— leucantha, iv. 112.
—— *lindleyi*, ii. 200.
—— *linearifolia*, ii. 200.
—— longifolia, ii. 202; iv. 58.
—— mollis, ii. 203.
—— *ocymifolia*, ii. 192.
—— odorata, ii. 203.
—— *odorata*, ii. 202.
—— ostruthioides, ii. 203.

Bidens pilosa, ii. 203; iv. 103.
—— procera, ii. 203; iv. 58.
—— procumbens, ii. 203.
—— *purpurea*, ii. 200.
—— *reptans*, ii. 199.
—— *rosea*, ii. 200.
—— sambucifolia, ii. 203.
—— sartorii, ii. 203.
—— *scabiosoides*, ii. 200.
—— *scandens*, ii. 194.
—— seemannii, ii. 203.
—— *squarrosa*, ii. 203.
—— striata, ii. 203.
—— *sulphurea*, ii. 200.
—— tereticaulis, ii. 203.
—— tetragona, ii. 204.
—— triplinervia, ii. 204.
—— *valladolidensis*, ii. 199.
—— warszewicziana, ii. 204.
Bifrenaria bella, iii. 214.
BIGELOVIA, ii. 115.
Bigelovia carnosa, ii. 120.
—— coronopifolia, ii. 115.
—— drummondii, iv. 52.
—— hartwegi, ii. 115.
—— oppositifolia, ii. 115.
—— pulchella, ii. 115.
—— veneta, ii. 115; iv. 52.
—— wrightii, ii. 115.
BIGNONIA, ii. 489.
Bignonia, iv. 146, 300.
Bignonia acutistipula, i. 490.
—— æquinoctialis, ii. 490.
—— *æsculifolia*, ii. 494.
—— andrieuxii, ii. 490.
—— buccinatoria, ii. 490.
—— *cherere*, ii. 490.
—— chica, ii. 490.
—— *copaia*, ii. 497.
—— difficilis, ii. 490.
—— *difficilis*, iv. 106.
—— diversifolia, ii. 490.
—— *diversifolia*, iv. 106.
—— *echinata*, ii. 493.
—— floribunda, ii. 490.
—— ghiesbreghtii, ii. 491.
—— *ghiesbreghtii*, iv. 292.
—— lanuginosa, ii. 491.
—— *latifolia*, ii. 494.
—— laurifolia, ii. 491; iv. 113.
—— lepidota, ii. 491.
—— *leucoxyla*, ii. 495.
—— *linearis*, ii. 494.
—— litoralis, ii. 491.
—— obovata, ii. 491.
—— *obovata*, ii. 310.
—— *orbiculata*, ii. 493.
Bignonia paniculata, ii. 493.
—— patellifera, ii. 491.
—— peltata, iv. 79.
—— prieurei, ii. 491.
—— pubescens, ii. 491.
—— *sarmentosa*, ii. 490.
—— *sinclairii*, ii. 491.
—— *stans*, ii. 497.
—— subincana, ii. 491.
—— *tecomoides*, ii. 496.
—— *uncata*, ii. 492.
—— unguis, ii. 492.
—— *viminalis*, ii. 497.
BIGNONIACEÆ, ii. 489; iv. 79, 106, 188, 203, 215, 217, 225.
BILLBERGIA, iii. 315.
Billbergia pallidiflora, iii. 315.
Billia hippocastanum, i. 212.
BISCUTELLA, i. 40.
Biscutella wislizeni, i. 40.
BIXA, i. 56.
Bixa orellana, iv. 143.
—— orellana, i. 56.
BIXEÆ, i. 55.
BIXINEÆ, iv. 8, 173, 204, 214, 216, 224.
BLAKEA, i. 433.
Blakea gracilis, i. 433.
—— *granatensis*, i. 433.
—— grandiflora, i. 433.
—— *lævigata*, i. 434.
—— *macrophylla*, i. 432.
BLAKEÆ, i. 433.
BLAINVILLEA, ii. 169.
Blainvillea dichotoma, iv. 112.
—— tampicana, ii. 169.
Blairia mexicana, ii. 533.
BLECHNEÆ, iii. 627.
BLECHNUM, iii. 627.
—— *aduncum*, iii. 628.
—— *angustifrons*, iii. 628.
—— asplenioides, iii. 627.
—— *caudatum*, iii. 628.
—— *ciliatum*, iii. 628.
—— *fraxineus*, iii. 627.
—— *galeotti*, iii. 628.
—— *glandulosum*, iii. 628.
—— *gracile*, iii. 627, 628.
—— *intermedium*, iii. 627.
—— lanceola, iii. 627.
—— longifolium, iii. 627.
—— *longifolium*, var. *gracile*, iii. 627.
—— longifolium, β. fraxineum, iv. 116.
—— *meridionale*, iii. 628.
—— occidentale, iii. 628.
—— ——, α. *majus*, iii. 628.
—— ——, β. *intermedium*, iii. 628.
Blechnum occidentale, γ. *solutum*, iii. 628.
—— ——, δ. *minus*, iii. 628.
—— *onocleodes*, iii. 626.
—— *polypodioides*, iii. 628.
—— *scabrum*, iii. 628.
—— serrulatum, iii. 628.
—— *triangulare*, iii. 628.
—— unilaterale, iii. 628.
—— volubile, iv. 116.
BLECHUM, ii. 508.
Blechum angustifolium, ii. 508.
—— brownei, ii. 508; iv. 106.
—— costaricense, ii. 508.
—— grandiflorum, ii. 508.
—— hænkei, ii. 508.
—— laxiflorum, ii. 508.
—— linnæi, ii. 508.
—— mexicanum, ii. 508.
BLEPHARODON, ii. 328.
Blepharodon, iv. 68, 284.
Blepharodon mucronatum, ii. 328.
—— *neriifolium*, ii. 336.
BLETIA, iii. 214.
Bletia, iv. 229, 268.
—— *acaulis*, iii. 244.
—— *acuminata*, iii. 246.
—— *acutipetala*, iii. 216.
—— adenocarpa, iii. 214.
—— *albida*, iii. 246.
—— *anceps*, iii. 246.
—— anomala, iii. 214.
—— *aphylla*, iii. 213.
—— *autumnalis*, iii. 246.
—— campanulata, iii. 214.
—— *campanulata*, iv. 303.
—— *capitata*, iii. 217.
—— coccinea, iii. 214.
—— *coccinea*, iv. 89, 301, 303.
—— *cordata*, iii. 245.
—— *cucullata*, iii. 245.
—— *digbyana*, iii. 246.
—— *flava*, iii. 246.
—— florida, iii. 214.
—— fulgens, iii. 215.
—— *furfuracea*, iii. 246.
—— *glauca*, iii. 246.
—— gracilis, iii. 215.
—— *grandiflora*, iii. 247.
—— *havanensis*, iii. 215.
—— jucunda, iii. 215.
—— lilacina, iii. 215.
—— *lineata*, iii. 245.
—— *nodosa*, iii. 245; iv. 270.
—— *pallida*, iii. 214.
—— parkinsoni, iii. 215.
—— *peduncularis*, iii. 247.

Bletia pumilio, iii. 245.
—— *punctata*, iv. 89.
—— *purpurata*, iii. 304; iv. 303, 304.
—— *purpurea*, iii. 216.
—— *reflexa*, iv. 303.
—— reflexa, iii. 215.
—— *rhopalorrhachis*, iii. 245.
—— roezlii, iii. 215.
—— *rubescens*, iii. 247.
—— secunda, iii. 215.
—— *secunda*, iv. 303.
—— *shepherdii*, iii. 216.
—— *speciosa*, iii. 247.
—— *tibicinis*, iii. 247.
—— *venosa*, iii. 245.
—— verecunda, iii. 215, 216.
—— *violacea*, iii. 247.
—— *wendlandi*, iii. 247.
Blighia sapida, i. 212.
BOCCONIA, i. 27.
Bocconia, iv. 229.
—— *cernua*, i. 27.
—— frutescens, i. 27; iv. 4.
—— integrifolia, i. 27.
—— *mexicana*, i. 27.
Bœbera chrysanthemoides, ii. 219.
—— *fastigiata*, ii. 219; iv. 61.
—— *incana*, ii. 219.
—— *porophyllum*, ii. 218.
BŒHMERIA, iii. 158.
Bœhmeria ampullacea, iii. 158.
—— *angustifolia*, iii. 160.
—— caudata, iii. 158.
—— cylindrica, iii. 159.
—— *elongata*, iii. 161.
—— fallax, iii. 159.
—— *flagelliformis*, iii. 158.
—— *guatemalana*, iii. 159.
—— *hirta*, iii. 160.
—— *petiolaris*, iii. 158.
—— ulmifolia, iii. 159.
—— *urticæfolia*, iii. 160.
BOERHAAVIA, iii. 4.
Boerhaavia, iv. 141, 142, 258.
Boerhaavia anisophylla, iii. 4.
—— *arborea*, iii. 9.
—— *arborescens*, iii. 9.
—— erecta, iii. 4; iv. 107, 114.
—— *erecta*, iii. 5.
—— eriosolena, iii. 4.
—— *gibbosa*, iii. 5.
—— *grahami*, iii. 5.
—— hirsuta, iii. 4.
—— *hirsuta*, iv. 233.
—— leiosolena, iii. 4.
—— linearifolia, iii. 4.
—— palmeri, iv. 82.
Boerhaavia paniculata, iii. 4.
—— purpurascens, iii. 5.
—— *rhomboidea*, iii. 8.
—— scandens, iii. 5.
—— *spicata*, iii. 5, 6.
—— virgata, iii. 5.
—— viscosa, iii. 5.
—— wrightii, iii. 5.
Bohadschia humifusa, i. 474.
Boisduvalia, iv. 243.
BOLANOSA, ii. 75.
Bolanosa coulteri, ii. 75.
Bolbophyllaria œrstedii, iii. 213.
—— *sordida*, iii. 213.
BOLDOA, iii. 7.
Boldoa, iii. 8.
Boldoa lanceolata, iii. 8.
—— *ovatifolia*, iii. 8.
—— *paniculata*, iii. 8.
—— *purpurascens*, iii. 8.
Bolivaria grisebachii, ii. 304.
—— *mexicana*, ii. 304.
BOLTONIA, ii. 120.
Boltonia, iv. 229.
Boltonia campestris, ii. 120.
—— *seemannii*, ii. 120.
BOMAREA, iii. 336.
Bomarea, iv. 147.
Bomarea acutifolia, iii. 336.
—— *acutifolia*, iv. 295.
—— affinis, iii. 336.
—— caldasiana, iii. 336.
—— chontalensis, iii. 336.
—— *gloriosa*, iii. 336.
—— hirtella, iii. 336.
—— *hirtella*, iv. 148, 150, 295.
—— miniata, iii. 337.
—— ovata, iii. 337.
BOMBACEÆ, i. 123.
BOMBAX, i. 124.
Bombax, iv. 146.
Bombax ellipticum, i. 124.
—— mexicanum, i. 124; iv. 14.
BOMBYCOSPERMUM, i. 123.
Bombycospermum mexicanum, i. 123.
—— *mexicanum*, ii. 384.
Bommeria pedata, iii. 678.
—— *podophylla*, iii. 677.
—— *pyramidale*, i. 125.
—— *retusum*, i. 124.
—— *schaffneri*, iii. 677.
BONNETIEÆ, i. 98.
BONPLANDIA, ii. 357.
Bonplandia, iv. 255.
Bonplandia geminiflora, ii. 357.
Bontia, ii. 526; iv. 207.
—— *daphnoides*, ii. 526.
BORAGINACEÆ, iv. 105.
BORAGINEÆ, ii. 366; iv. 71, 187, 202, 215, 217, 225, 256.
Borreria, ii. 58, 59, 60, 61.
—— *distans*, ii. 58.
—— *ferruginea*, ii. 58.
—— *lævis*, ii. 59.
—— *psyllioides*, ii. 60.
—— *ramisparsa*, ii. 59.
—— *spinosa*, ii. 60.
—— *subulata*, ii. 60.
—— *verticillata*, ii. 60.
BORRICHIA, ii. 169.
Borrichia arborescens, iv. 103, 112.
—— frutescens, ii. 169.
BOSCHNIAKIA, ii. 469.
Boschniakia, iv. 229.
—— *glabra*, ii. 469.
Botherpe longispatha, iii. 328.
Bothriochilus bellus, iii. 214.
BOTRYCHIUM, iii. 698.
Botrychium brachystachys, iii. 698.
—— *decompositum*, iii. 698.
—— *obliquum*, iii. 698.
—— ternatum, iii. 698.
—— virginianum, iii. 698.
—— ——, var. *mexicanum*, iii. 698.
Botrydium schraderi, iii. 23.
Botryogramme karwinskii, iii. 617.
Botryopterys mexicana, iii. 697.
BOUCHEA, ii. 531.
Bouchea ehrenbergii, ii. 531.
BOUCHETIA, ii. 436.
Bouchetia, ii. 437.
Bouchetia erecta, ii. 436.
—— *erecta*, ii. 437, 438.
—— procumbens, ii. 437.
Bougainvillea spectabilis, iv. 114.
BOURRERIA, ii. 369.
Bourreria andrieuxii, ii. 369.
—— formosa, ii. 369.
—— *formosa*, ii. 370.
—— grandiflora, ii. 370.
—— huanita, ii. 370.
—— revoluta, ii. 370.
—— spathulata, ii. 370.
BOUSSINGAULTIA, iii. 27.
Boussingaultia baselloides, iii. 27.
—— *leptostachys*, iii. 27.
—— ramosa, iii. 27.
BOUTELOUA, iii. 560.
Bouteloua, iii. 564; iv. 140, 141, 280, 309.
Bouteloua aristidoides, iii. 561.
—— *aristoides*, iv. 279.
—— bromoides, iii. 561.

Bouteloua chondrosioides, iii. 561.
—— *curtipendula*, iii. 563.
—— disticha, iv. 95.
—— hirsuta, iii. 562.
—— *humboldtiana*, iii. 561.
—— oligostachya, iii. 562; iv. 279.
—— *ovata*, iii. 561.
—— polystachya, iii. 562.
—— *polystachys*, iv. 279.
—— prostrata, iii. 562.
—— *prostrata*, iii. 563.
—— racemosa, iii. 563.
—— scorpioides, iii. 563.
—— tenuis, iii. 563.
—— triathera, iii. 564.
—— trifida, iii. 564.
—— *vestita*, iii. 562.
BOUVARDIA, ii. 7.
Bouvardia, iv. 213, 249.
Bouvardia angustifolia, ii. 7.
—— bicolor, ii. 7.
—— cavanillesi, iii. 7.
—— chlorantha, ii. 7.
—— chrysantha, ii. 8.
—— *coccinea*, ii. 10.
—— cordifolia, ii. 8.
—— corymbosa, ii. 8.
—— *crocata*, ii. 8.
—— *discolor*, ii. 18.
—— flava, ii. 8.
—— glaberrima, ii. 8.
—— glabra, ii. 8.
—— hirtella, ii. 8; iv. 141.
—— houtteana, ii. 8.
—— hypoleuca, ii. 8.
—— *jacquini*, ii. 10.
—— lævis, ii. 8.
—— leiantha, ii. 9.
—— linearis, ii. 9.
—— *longiflora*, ii. 30.
—— microphylla, ii. 9.
—— mollis, ii. 9.
—— *multiflora*, ii. 7.
—— myrtifolia, ii. 9.
—— obovata, ii. 9.
—— ovata, ii. 9.
—— quaternifolia, ii. 9.
—— rosea, ii. 9.
—— scabra, ii. 9.
—— scabrida, ii. 9.
—— schiedeana, ii. 9.
—— *splendens*, ii. 10.
—— *strigosa*, ii. 24.
—— tenuiflora, ii. 9.
—— *ternifolia*, ii. 10.
—— tolucana, ii. 10.
—— *triflora*, ii. 30.
Bouvardia triphylla, ii. 10.
—— versicolor, ii. 10.
—— viminalis, ii. 10.
—— viperalis, ii. 10.
—— xylosteoides, ii. 10.
Bowenia, iv. 267.
BOWLESIA, i. 559.
Bowlesia lobata, i. 559.
BRACHISTUS, ii. 423.
Brachistus diversifolius, ii. 423.
—— ligustrinus, ii. 423.
—— *linnæanus*, ii. 423.
—— *neesianus*, ii. 423.
—— solanaceus, ii. 424.
—— stramonifolius, ii. 424.
Brachyachyris, ii. 111.
Brachycome xanthocomoides, ii. 118.
Brachyglossis, iv. 76.
—— *coulteri*, ii. 437.
—— *texana*, ii. 438.
Brachyloma incurvum, ii. 478.
—— *longifolium*, ii. 479.
—— *petiolare*, ii. 479.
—— *pictum*, ii. 479.
—— *pilosum*, ii. 479.
—— *strictum*, ii. 479.
—— *tubiflorum*, ii. 480.
BRACHYPODIUM, iii. 584.
Brachypodium cæspitosum, iii. 584.
—— latifolium, iii. 584.
—— mexicanum, iii. 584.
—— *pinnatum*, iii. 584.
—— subulatum, iii. 584; iv. 297.
BRACHYPTERYS, i. 151.
Brachypterys borealis, i. 151.
Brachyramphus intybaceus, ii. 262.
Brachyris, ii. 111.
—— *microcephala*, ii. 112.
BRAHEA, iii. 411.
Brahea, iv. 147.
Brahea calcarea, iii. 411.
—— dulcis, iii. 411.
Brainea, iii. 672.
Brandesia mexicana, iii. 16.
—— *pubiflora*, iii. 17.
—— *pycnantha*, iii. 17.
BRASENIA, i. 24.
Brasenia peltata, i. 24.
BRASSAVOLA, iii. 244.
Brassavola acaulis, iii. 244.
—— *appendiculata*, iii. 245.
—— *cordata*, iii. 245.
—— cucullata, iii. 245.
—— *cuspidata*, iii. 245.
—— *digbyana*, iii. 246.
—— *glauca*, iii. 246; iv. 301.
—— *grandiflora*, iii. 245.
Brassavola lineata, iii. 245.
—— *matthieuana*, iii. 245.
—— nodosa, iii. 245.
—— *odoratissima*, iii. 245.
—— pumilia, iii. 245.
—— rhopalorrhachis, iii. 245.
—— venosa, iii. 245.
BRASSIA, iii. 287.
Brassia angusta, iii. 288.
—— *aristata*, iii. 288.
—— brachiata, iii. 287.
—— caudata, iii. 288.
—— *coryandra*, iii. 288.
—— chlorops, iii. 288.
—— *cochleata*, iii. 288.
—— gireoudiana, iii. 288.
—— *guttata*, iii. 288.
—— lanceana, iii. 288.
—— lawrenceana, iii. 288.
—— *lawrenceana*, var. *longissima*, iii. 288.
—— *longiloba*, iii. 288.
—— *macrostachya*, iii. 288.
—— maculata, iii. 288.
—— neglecta, iii. 288.
—— *odontoglossoides*, iii. 288.
—— *pumila*, iii. 288.
—— verrucosa, iii. 288.
—— *warscewiczii*, iii. 287.
—— *wrayæ*, iii. 288.
Brassica sativa, i. 38.
BRASSICEÆ, i. 38.
BRAVAISIA, ii. 509.
Bravaisia floribunda, ii. 509.
—— *floribunda*, iv. 106.
—— tubiflora, iv. 106.
—— *tubiflora*, iv. 110.
BRAVOA, iii. 337.
Bravoa cœtocapnia, iii. 337.
—— geminiflora, iii. 337.
—— sessiliflora, iii. 338.
Braya, i. 35.
BREWERIA, ii. 400.
Breweria, iv. 234.
Breweria mexicana, ii. 400.
—— ovalifolia, ii. 420.
BRICKELLIA, ii. 104.
Brickellia, iv. 213, 252.
Brickellia betonicæfolia, ii. 104.
—— cavanillesii, ii. 104.
—— corymbosa, ii. 104.
—— coulteri, ii. 105; iv. 51.
—— cylindracea, ii. 105.
—— dentata, ii. 105.
—— diffusa, ii. 105; iv. 112.
—— floribunda, ii. 105.
—— galeottii, ii. 105.

Brickellia hartwegi, iii. 105.
—— hebecarpa, ii. 105.
—— humilis, ii. 104.
—— hymenochlæna, ii. 105.
—— *laciniata*, ii. 105.
—— lanata, ii. 106.
—— odontophylla, iv. 51.
—— oliganthes, ii. 106.
—— palmeri, ii. 106.
—— parryi, ii. 106.
—— pendula, ii. 106.
—— reticulata, ii. 106.
—— *riddellii*, ii. 105.
—— rosalesia, ii. 106.
—— scoparia, ii. 106.
—— secundiflora, ii. 106.
—— *secundiflora*, iv. 288.
—— seemannii, ii. 107.
—— simplex, ii. 107.
—— spinulosa, ii. 107.
—— squamulosa, ii. 107.
—— tenera, ii. 107.
—— thyrsiflora, ii. 107.
—— tomentella, ii. 107.
—— veronicæfolia, ii. 107.
—— wislizeni, ii. 107.
—— wrightii, ii. 107.
BRIZA, iii. 579.
Briza caroliniana, iii. 578.
—— *eragrostis*, iii. 575.
—— *lamarkiana*, iii. 579.
—— rotundata, iii. 579.
Brizopyrum condensatum, iii. 578.
—— *obtusiflorum*, iii. 579.
—— *pilosum*, iii. 579.
—— *prostratum*, iii. 578.
BROMELIA, iii. 313.
Bromelia bracteata, iii. 314.
—— *karatas*, iii. 313.
—— pinguin, iii. 313.
BROMELIACEÆ, iii. 313; iv. 90.
Bromeliaceæ, iv. 27, 196, 202, 217.
BROMUS, iii. 583.
Bromus, iii. 567; iv. 149.
Bromus anomalus, iii. 583; iv. 297.
—— *canadensis*, iii. 583.
—— ciliatus, iii. 583.
—— *ciliatus*, iv. 279.
—— *compressus*, iii. 583.
—— exaltatus, iii. 583.
—— *exaltatus*, iv. 297.
—— *hookeri*, iii. 583.
—— *lividus*, iii. 582; iv. 305.
—— *marginatus*, iii. 583.
—— *pendulinus*, iii. 583.
Bromus pubescens, iii. 583.
—— *purgans*, iii. 583.
—— *rotundatus*, iii. 579.
—— *segetum*, iii. 583.
—— *setifolius*, iii. 583.
—— *subalpinus*, iii. 583; iv. 305.
—— unioloides, iii. 584.
—— *virgatus*, iii. 583.
—— *willdenowii*, iii. 584.
BRONGNIARTIA, i. 252.
Brongniartia benthamiana, i. 252.
—— foliolosa, i. 253.
—— *foliolosa*, i. 256.
—— galegoides, i. 253.
—— glabrata, i. 253.
—— gracilis, i. 253.
—— *gracilis*, i. 254; iv. 27.
—— intermedia, i. 254.
—— *intermedia*, i. 256.
—— magnibracteata, i. 254.
—— mollis, i. 254.
—— oligospermoides, i. 254.
—— oxyphylla, i. 254.
—— parryi, i. 254.
—— podalyrioides, i. 255.
—— retusa, i. 255.
—— sericea, i. 255.
—— stipitata, i. 255.
—— *stipitata*, i. 254, 256.
—— thermoides, i. 256.
—— *thermoides*, i. 253.
—— vicioides, i. 256.
—— *vicioides*, iv. 284.
Bronnia spinosa, i. 81.
BROSIMUM, iii. 148.
Brosimum alicastrum, iii. 148.
—— costaricanum, iii. 148.
Brotera alba, i. 129.
—— *ovata*, i. 129.
Broteroa trinervata, ii. 216.
Broughtonia aurea, iii. 226.
—— *chinensis*, iii. 235.
Broussonetia speciosa, i. 321.
—— *tinctoria*, iii. 141.
BROWALLIA, ii. 438.
Browallia demissa, ii. 438.
—— *elata*, ii. 438.
—— *texana*, ii. 437.
Brugmansia arborea, ii. 428.
—— *bicolor*, ii. 428.
—— *candida*, ii. 427.
—— *floribunda*, ii. 429.
—— *sanguinea*, ii. 428.
—— *suaveolens*, ii. 428.
BRUNELLA, ii. 570.
Brunella vulgaris, ii. 570.
BRUNELLIA, i. 174.
Brunellia comocladifolia, i. 174.
—— quadrilocularis, i. 174.
Bruniaceæ, iv. 179.
Brunnichia, iv. 259.
Brunonia, ii. 263.
BRYA, i. 269.
Brya nicaraguensis, i. 270.
Bryonia attenuata, i. 486.
—— *racemosa*, i. 486.
BRYOPHYLLUM, i. 387.
Bryophyllum calycinum, i. 387; iv. 100.
Bryum, iv. 149, 150, 151.
—— *argenteum*, iv. 150.
Bubroma, i. 133.
BUCHLOË, iii. 566.
Buchloë, iv. 279, 309.
Buchloë dactyloides, iii. 566.
BUCHNERA, ii. 456; iv. 77.
Buchnera, ii. 457.
—— *americana*, ii. 457.
—— ——, var. *glabrior*, ii. 457.
—— *disticha*, iv. 77.
—— elongata, ii. 457.
—— *elongata*, iv. 77.
—— ——, var. *pilosa*, ii. 457.
—— *grandiflora*, ii. 456.
—— *lithospermifolia*, ii. 457; iv. 77.
—— major, ii. 457.
—— mexicana, ii. 457.
—— *mexicana*, iv. 77.
—— ——, var. *minor*, ii. 457.
—— minor, ii. 457.
—— obliqua, ii. 457.
—— *pilosa*, ii. 457; iv. 77.
—— rosea, ii. 457.
—— tinctoria, ii. 457; iv. 77.
Bucholzia maritima, iii. 16.
—— *obovata*, iii. 16.
—— *polygonoides*, iii. 16.
Buchosia aquatica, iii. 385.
Bucida buceras, i. 402.
BUDDLEIA, ii. 340.
Buddleia, iv. 148.
Buddleia abbreviata, ii. 340.
—— *abbreviata*, iv. 290.
—— *acuminata*, ii. 341.
—— alpina, ii. 341.
—— *alpina*, iv. 159, 290.
—— americana, ii. 341.
—— barbata, ii. 341.
—— *brevifolia*, ii. 340.
—— *callicarpioides*, ii. 341.
—— cordata, ii. 341.
—— *decurrens*, ii. 341.
—— elliptica, ii. 341.
—— floccosa, ii. 341.

Buddleia floribunda, ii. 341.
—— gracilis, ii. 341.
—— humboldtiana, ii. 341.
—— *humboldtiana*, iv. 290.
—— intermedia, ii. 342.
—— *intermedia*, iv. 290.
—— lanceolata, ii. 342.
—— *lanceolata*, iv. 290.
—— macrophylla, ii. 342.
—— marrubifolia, ii. 342.
—— meliodora, ii. 342.
—— microphylla, ii. 342; iv. 290.
—— nitida, ii. 342.
—— *obtusifolia*, ii. 342.
—— *occidentalis*, ii. 341.
—— ovalifolia, ii. 342.
—— parviflora, ii. 342.
—— perfoliata, ii. 342.
—— pringlei, iv. 70.
—— propinqua, ii. 343.
—— *pseudo-verticillata*, ii. 343.
—— *rufescens*, ii. 341.
—— scordioides, ii. 343.
—— sessiliflora, ii. 343.
—— spectabilis, ii. 343.
—— *sphærantha*, ii. 342.
—— venusta, ii. 343.
—— verticillata, ii. 343.
Buena macrocarpa, ii. 12.
—— *skinneri*, ii. 12.
BUETTNERIA, i. 135.
Buettneria carthagenensis, i. 136; iv. 15.
—— *catalpæfolia*, i. 136.
—— lanceolata, i. 136.
—— lateralis, i. 136.
—— rubicaulis, i. 136.
—— salicifolia, i. 136.
—— tiliæfolia, i. 136.
BUETTNERIEÆ, i. 133.
Bulbophyllaria aristata, iii. 213.
BULBOPHYLLUM, iii. 213.
Bulbophyllum aristatum, iii. 213.
—— œrstedii, iii. 213.
—— sordidum, iii. 213.
Bulbostylis cavanillesii, ii. 104.
—— *diffusa*, ii. 105.
—— *hebecarpa*, ii. 105.
—— *lanata*, ii. 106.
—— *nepetæfolia*, ii. 104.
—— *oliganthes*, ii. 106.
—— *pedunculosa*, ii. 97.
—— *pendula*, ii. 106.
—— *reticulata*, ii. 106.
—— *rigida*, ii. 106.
—— *scandiflora*, ii. 106.
—— *spinaciæfolia*, ii. 101.
Bulbostylis subuligera, ii. 102.
—— *triangularis*, ii. 109.
—— *veronicæfolia*, ii. 107.
BUMELIA, ii. 297.
Bumelia, iv. 309.
Bumelia cuneata, ii. 297.
—— ferox, ii. 297.
—— hayesii, ii. 297.
—— læte-virens, ii. 298.
—— lycioides, ii. 298.
—— occidentalis, ii. 298.
—— persimilis, ii. 298.
—— *reclinata*, ii. 298.
—— retusa, iv. 104, 113.
—— spiniflora, ii. 299.
—— spinosa, ii. 299; iv. 67.
—— subsessiliflora, ii. 299.
BUNCHOSIA, i. 147.
Bunchosia bilocellata, i. 147.
—— *bilocellata*, i. 148.
—— cornifolia, i. 147.
—— *discolor*, i. 147, 148.
—— glandulifera, i. 148.
—— glauca, i. 148.
—— *glauca*, i. 147.
—— lanceolata, i. 148.
—— lindeniana, i. 148.
—— *mollis*, i. 148.
—— montana, i. 148.
—— nitida, i. 148.
—— pilosa, i. 148.
—— strigosa, i. 148.
Burlingtonia, iii. 271.
Burmannia, iii. 196.
—— *biflora*, iii. 196.
—— *capitata*, iii. 196.
BURMANNIACEÆ, iii. 196.
Burmanniaceæ, iv. 195, 205, 215, 217.
BURMEISTERA, ii. 263.
Burmeistera, iv. 253.
Burmeistera virescens, ii. 263; iv. 66.
BURSERA, i. 177; iv. 18.
Bursera, iv. 213, 233.
Bursera aloexylon, iv. 20.
—— bicolor, iv. 20.
—— bipinnata, iv. 19.
—— cinerea, iv. 18.
—— cuneata, iv. 20.
—— delpechiana, iv. 20.
—— excelsa, iv. 20.
—— fagaroides, iv. 19.
—— *fagaroides, α. elliptica*, iv. 19.
—— ——, *β. crenulata*, iv. 19.
—— ——, *γ. ramosissima*, iv. 19.
—— ——, *δ. bourgeauana*, iv. 19.
—— galeottiana, iv. 19.
—— gracilis, iv. 19.
Bursera grandifolia, iv. 19.
—— graveolens, iv. 19.
—— *graveolens*, iv. 233.
—— ——, *α. pubescens*, iv. 19.
—— ——, *β. pilosa*, iv. 19.
—— gummifera, i. 177; iv. 18.
—— ——, β. pubescens, iv. 18.
—— heterophylla, iv. 19.
—— jorullensis, iv. 20.
—— karwinskii, iv. 18.
—— kerberi, iv. 18.
—— lancifolia, iv. 18.
—— lanuginosa, iv. 20.
—— mexicana, iv. 19.
—— microphylla, i. 177; iv. 19.
—— multijuga, iv. 18.
—— obovata, i. 177.
—— *obovata*, iv. 21.
—— ovalifolia, iv. 18.
—— pannosa, iv. 20.
—— penicillata, iv. 20.
—— schiedeana, iv. 20.
—— schlechtendalii, iv. 18.
—— sessiliflora, iv. 20.
—— submoniliformis, iv. 20.
BURSERACEÆ, i. 177; iv. 18.
Burseraceæ, iv. 176, 203, 216, 233.
BURSEREÆ, i. 177.
Bursereæ, iv. 18.
BYRSONIMA, i. 145.
Byrsonima berteroana, i. 145.
—— coriacea, i. 145; iv. 111.
—— cotinifolia, i. 145.
—— *cotinifolia*, i. 146.
—— crassifolia, i. 146.
—— ——, var., iv. 97.
—— *cumingiana*, i. 146; iv. 97.
—— karwinskiana, i. 146.
—— oaxacana, i. 146.
—— panamensis, i. 146.
—— pulchra, i. 146.
—— rufescens, i. 146.
—— spicata, i. 146.
—— stigmatophorus, i. 146.
—— verbascifolia, i. 146.

CABOMBA, i. 25.
Cabomba aquatica, i. 25.
CABOMBEÆ, i. 24.
CACABUS, iv. 75.
Cacabus mexicanus, iv. 75.
Cacalia, ii. 235, 249; iv. 63, 64.
—— *amplifolia*, ii. 235.
—— *berlandieri*, ii. 239.
—— *cervariæfolia*, ii. 237.
—— *cirsiifolia*, ii. 238.
—— *cordifolia*, ii. 237.

Cacalia decomposita, ii. 241.
—— *heterogama*, ii. 242.
—— *jatrophoides*, ii. 242.
—— *linaria*, ii. 217.
—— *linifolia*, ii. 217.
—— *napeæfolia*, ii. 244.
—— *pachyphylla*, ii. 247.
—— *parasitica*, ii. 244.
—— *peltata*, ii. 245.
—— *racemosa*, ii. 241.
—— *radulæfolia*, ii. 246.
—— *runcinata*, ii. 238.
—— *sessilifolia*, ii. 247.
—— *sinuata*, ii. 237.
—— *toluccana*, ii. 239.
—— *tussilaginoides*, ii. 239.
Cacao sativa, i. 133.
Caciostega anomala, iii. 567.
CACOUCIA, i. 404.
Cacoucia, iv. 230.
Cacoucia coccinea, i. 404.
—— *coccinea*, iv. 230.
CACTACEÆ, i. 501; iv. 101.
Cactaceæ, iv. 181, 202, 225, 233, 245.
Cacteæ, i. 501.
Cactus bleo, i. 555.
—— *bonplandii*, i. 554.
—— *bradypus*, i. 546.
—— *cochinellifer*, i. 549.
—— *coronatus*, i. 506.
—— *cylindricus*, i. 506.
—— *flagelliformis*, i. 542.
—— *flavescens*, i. 509.
—— *gibbosus*, i. 531.
—— *nobilis*, i. 545.
—— *opuntia*, i. 554.
—— *phyllanthoides*, i. 548.
—— *phyllanthus*, i. 548.
—— *recurvus*, i. 537.
—— *senilis*, i. 246.
—— *speciosus*, i. 548.
—— *stellatus*, i. 519.
—— *tomentosus*, i. 554.
Cadiscus, iv. 252.
Cænopteris achilleæfolia, iii. 629.
—— *myriophylla*, iii. 638.
Cæsalpineæ, iv. 178.
CÆSALPINIA, i. 323.
Cæsalpinia affinis, i. 323.
—— *bonduc*, i. 324.
—— bonducella, i. 324.
—— *cacalaco*, i. 324.
—— coriaria, i. 324.
—— eriostachys, i. 324.
—— exostemma, i. 324.
—— glabrata, i. 325.
Cæsalpinia gracilis, i. 324.
—— laxa, i. 325.
—— mexicana, i. 325.
—— pulcherrima, i. 325; iv. 99, 112.
CÆSALPINIEÆ, i. 323.
Cajanus indicus, i. 310.
CAKILE, i. 40.
Cakile æqualis, iv. 111.
—— *americana*, i. 40.
—— maritima, i. 40; iv. 97.
CAKILINEÆ, i. 40.
Caladium auritum, iii. 423.
—— *xanthorrhizon*, iii. 418.
Calais linearifolia, ii. 260.
Calamagrostis eriantha, iii. 553.
—— *junciformis*, iii. 554.
—— *mexicana*, iii. 539.
—— *orizabæ*, iii. 554.
—— *quitensis*, iii. 539.
—— *schiedeana*, iii. 554.
—— *sesquitriflora*, iii. 554.
—— *tenuifolia*, iii. 543.
—— *tolucensis*, iii. 554.
CALAMINTHA, ii. 551.
Calamintha macrostema, ii. 551.
—— *macrostema*, iv. 292.
CALAMOCHLOA, iii. 570.
Calamochloa, iv. 279.
Calamochloa filifolia, iii. 570.
CALANDRINIA, i. 80.
Calandrinia, iv. 234.
Calandrinia caulescens, i. 80.
—— megarhiza, i. 80.
—— *megarhiza*, iv. 283.
—— micrantha, iv. 12.
—— tuberosa, i. 80.
CALANTHE, iii. 217.
Calanthe mexicana, iii. 217.
Calanthera dactyloides, iii. 566.
Calanthus multiflorus, ii. 484.
CALATHEA, iii. 311.
Calathea, iv. 231.
—— *guianensis*, iii. 311.
—— *laxa*, iii. 309.
Calboa globosa, ii. 389.
—— *vitifolia*, ii. 391.
CALCEOLARIA, ii. 439.
Calceolaria, iv. 149, 157, 234, 257, 314.
—— *calycina*, ii. 439.
—— glutinosa, ii. 439.
—— mexicana, ii. 439.
—— *mexicana*, iv. 291.
—— *perfoliata*, ii. 439.
—— *trachelifolia*, ii. 439.
—— trilobata, ii. 439.
Calceolaria trilobata, iv. 291.
Caldasia heterophylla, ii. 357.
CALEA, ii. 205.
Calea albida, ii. 205.
—— *aspera*, ii. 182.
—— axillaris, ii. 205.
—— brachiata, ii. 205.
—— cacosmoides, ii. 205.
—— discolor, ii. 205.
—— elegans, ii. 205.
—— integrifolia, ii. 205.
—— *lobata*, ii. 233.
—— manicata, ii. 206.
—— peduncularis, ii. 206.
—— prunifolia, ii. 206.
—— rugosa, ii. 206.
—— sabazioides, ii. 206.
—— salmiæfolia, ii. 206.
—— scabrifolia, ii. 206.
—— sessilifolia, ii. 206.
—— tomentosa, ii. 206.
—— urticæfolia, ii. 207.
—— *urticæfolia*, ii. 205.
—— zacatechichi, ii. 207.
Caleacte urticæfolia, ii. 207.
Calebrachys peduncularis, ii. 206.
CALENDULACEÆ, ii. 250.
Calinea, i. 12.
Callæolepium warscewiczii, ii. 336.
CALLIANDRA, i. 356.
Calliandra, iv. 213, 299.
Calliandra angelica, i. 356.
—— canescens, i. 356.
—— capillata, i. 356.
—— carbonaria, i. 357.
—— *chamædrys*, i. 357.
—— conferta, i. 357.
—— coulteri, iv. 33.
—— cumingii, i. 357.
—— *cumingii*, iv. 284.
—— emarginata, i. 357.
—— eriophylla, i. 357.
—— formosa, i. 357.
—— grandiflora, i. 357.
—— harrisii, i. 357.
—— *herbacea*, i. 358.
—— hirsuta, i. 358.
—— houstoni, i. 358.
—— humilis, i. 358.
—— *kunthii*, i. 357.
—— lambertiana, i. 358.
—— laxa, i. 358.
—— magdalenæ, i. 358.
—— malacophylla, i. 358.
—— *pallens*, i. 359.
—— portoricensis, i. 358; iv. 33.
—— *portoricensis*, iv. 230.

Calliandra seemanni, i. 358.
—— tetragona, i. 358.
—— tetraphylla, i. 359.
—— wendlandi, i. 359.
—— *xalapensis*, i. 358.
Callianira melastomoides, iii. 51.
Callibrachoa procumbens, ii. 436.
CALLICARPA, ii. 538.
Callicarpa acuminata, ii. 538; iv. 107, 113.
—— parvifolia, ii. 538.
—— *subintegerrima*, ii. 538.
CALLICHLAMYS, ii. 494.
Callichlamys riparia, ii. 494.
—— *rubiginosa*, ii. 494.
—— *rufinervis*, ii. 494.
—— *splendida*, ii. 494.
CALLIRHOE, i. 98.
Callirhoe involucrata, i. 98; iv. 13.
—— lineariloba, iv. 13.
—— *spicata*, i. 99.
CALLISIA, iii. 395.
Callisia delicatula, iii. 395.
—— insignis, iii. 395.
—— martensiana, iii. 395.
—— *monandra*, iii. 395.
—— repens, iii. 395.
—— umbellulata, iii. 395.
CALLITRICHE, i. 401.
Callitriche asa-græi, i. 401; iv. 35.
—— austini, iv. 35.
—— deflexa, i. 401.
—— heterophylla, iv. 35.
—— verna, i. 401.
CALOCHORTUS, iii. 379.
Calochortus, iv. 274.
Calochortus bonplandianus, iii. 380.
—— flavus, iii. 380.
—— fuscus, iii. 380.
—— ghiesbreghtianus, iii. 380.
—— hartwegii, iii. 380.
—— *pallidus*, iii. 380.
—— *purpureus*, iii. 380.
—— spatulatus, iii. 380.
Calonnea pulcherrima, ii. 228.
Calonyction bona-nox, iv. 105.
—— *chenopodifolium*, ii. 385.
—— *dubium*, ii. 386.
—— proximum, ii. 392.
—— *speciosum*, ii. 384.
—— venustum, ii. 395.
CALOPHANES, ii. 502.
Calophanes angustifolia, ii. 502.
—— bilabiatus, ii. 502.
—— capitatus, ii. 502.
—— decumbens, ii. 502.
—— *decumbens*, iv. 79.
Calophanes hirsutissima, ii. 502.
—— jasminum-mexicanum, ii. 503; iv. 79.
—— linearis, ii. 503.
—— microphylla, ii. 503.
—— *oblongifolia*, ii. 502.
—— ——, var. *texensis*, ii. 503.
—— ovata, ii. 503.
—— *ovata*, ii. 502.
—— quadrangularis, ii. 503.
—— quitensis, ii. 503.
—— schiedeana, ii. 503.
—— *schiedeana*, iv. 79.
CALOPHYLLUM, i. 89.
Calophyllum edule, i. 88.
—— longifolium, i. 89.
CALOPHYSA, i. 432.
Calophysa setosa, i. 432.
—— vesiculosa, i. 432.
Caloplectus macrophyllus, ii. 484.
CALOPOGONIUM, i. 300.
Calopogonium brachycarpum, i. 300.
—— cæruleum, i. 301.
—— galactoides, i. 301.
Caloseris rupestris, ii. 254.
Calotheca rotundata, iii. 579.
—— *sabulosa*, iii. 548.
Calycadenia harrisii, ii. 314.
Calycanthaceæ, iv. 171.
Calycereæ, ii. 69; iv. 182.
CALYCIFLORÆ, i. 223.
CALYCOLPUS, i. 406.
Calycolpus glaber, i. 407.
CALYCOPHYLLUM, ii. 12.
Calycophyllum candidissimum, ii. 12.
—— *coccineum*, ii. 15.
—— *tubulosum*, ii. 15.
CALYCORECTES, i. 409.
Calycorectes mexicana, i. 409.
CALYCOSERIS, ii. 261.
Calycoseris wrightii, ii. 261.
—— *wrightii*, iv. 141.
Calydermos, ii. 425.
—— *longifolius*, ii. 206.
—— *peduncularis*, ii. 206.
—— *rugosus*, ii. 206.
—— *salmiæfolius*, ii. 206.
—— *scaber*, ii. 206.
Calydorea, iii. 328.
Calydorea longispatha, iii. 328.
—— *multiflora*, iii. 328.
—— *punctata*, iii. 328, 329.
Calymenia, iii. 2.
—— *corymbosa*, iii. 3.
—— *viscosa*, iii. 3.
Calypso borealis, iv. 269.
Calypterogyne, iv. 276.
Calyptocarpus vialis, ii. 169.
CALYPTRANTHES, i. 408.
Calyptranthes, i. 413.
Calyptranthes bullata, i. 408.
—— chytraculia, i. 408.
—— costaricensis, i. 408.
—— karwinskiana, i. 408.
—— lindeniana, i. 408.
—— *pendula*, i. 408.
—— schiedeana, i. 409.
—— schlechtendaliana, i. 409.
CALYPTRELLA, i. 422.
Calyptrella galeottii, i. 422.
Calyptrion, i. 48.
—— *aubletii*, i. 49.
—— *berterii*, i. 48.
—— *mexicana*, i. 48.
CALYPTROCARYA, iii. 468.
Calyptrocarya longifolia, iii. 468.
—— palmetta, iii. 468.
CALYPTROGYNE, iii. 409.
Calyptrogyne ghiesbrechtiana, iii. 410.
—— glauca, iii. 410.
—— sarapiguensis, iii. 410.
—— spicigera, iii. 410.
CALYPTROPSIDIUM, i. 409.
Calyptropsidium friedrichsthalianum, i. 409.
—— *friedrichsthalianum*, i. 406.
Calyptrostylis fascicularis, iii. 465.
—— *florida*, iii. 465.
—— *paniculata*, iii. 466.
—— *schiedeana*, iii. 467.
Calystegia sepium, ii. 396.
—— *setifera*, ii. 394.
—— *soldanella*, ii. 396.
Calyxhymenia, iii. 2.
—— *aggregata*, iii. 2.
—— *cervantesii*, iii. 3.
—— *glabrifolia*, iii. 3.
—— *viscosa*, iii. 3.
Camaridium luteorubrum, iii. 266.
CAMARIDIUM, iii. 268.
Camaridium ochroleucum, iii. 265.
CAMPANEA, ii. 480.
Campanea grandiflora, ii. 480.
—— humboldtii, ii. 480.
—— œrstedii, ii. 480.
CAMPANULA, ii. 270.
Campanula flagellaris, ii. 271.
—— *perfoliata*, ii. 271.
—— rotundifolia, ii. 271.
—— *rotundifolia*, iv. 253.

CAMPANULACEÆ, ii. 263; iv. 66, 103.
Campanulaceæ, iv. 184, 202, 215, 217, 225, 253.
CAMPDERIA, iii. 37.
Campderia, iv. 259.
Campderia floribunda, iii. 37.
—— lindeniana, iii. 37.
—— nematostachya, iii. 37.
CAMPELIA, iii. 396.
Campelia hoffmanni, iv. 91.
—— *mexicana*, iii. 396.
—— zanonia, iii. 396.
Campomanesia glabra, i. 407.
—— *gœtheana*, i. 407.
Campteria biaurita, iii. 622.
Campulosus planifolius, iii. 558.
Campylobotrys, ii. 35.
—— *discolor*, ii. 36.
—— *ghiesbreghtii*, ii. 36.
CAMPYLOCENTRON, iii. 292.
Campylocentron schiedei, iii. 292.
Campyloneuron angustifolium, iii. 654.
—— *caudatum*, iii. 666.
—— coarctatum, iii. 656.
—— *coarctatum*, iii. 656.
—— *dimorphum*, iii. 654.
—— fasciale, iii. 661.
—— *jalapense*, iii. 666.
—— lævigatum, iii. 661.
—— phyllitidis, iii. 665.
—— *phyllitidis*, iii. 666, 668.
—— *repens*, iii. 668.
—— sphenodes, iii. 669.
—— *tæniosum*, iii. 654.
CANAVALIA, i. 302.
Canavalia brasiliensis, i. 302.
—— ensiformis, i. 302.
—— *gladiata*, i. 302.
—— *multiflora*, i. 303.
—— obtusifolia, i. 303; iv. 31.
—— *rostrata*, i. 303.
—— rutilans, i. 303.
—— villosa, i. 303; iv. 31.
Canellaceæ, iv. 173.
CANNA, iii. 311.
Canna aurantiaca, iii. 312.
—— cinnabarina, iii. 311.
—— glauca, iii. 311.
—— *glauca, β. rufa*, iii. 311.
—— heliconiæfolia, iii. 311.
—— indica, iv. 114.
—— *indica*, iii. 312.
—— *lagunensis*, iii. 312.
—— liliiflora, iii. 312.
—— longifolia, iii. 312.
Canna mexicana, iii. 311.
—— *pallida*, iii. 312.
—— patens, iii. 312.
—— warscewiczii, iii. 312.
—— *xalapensis*, iii. 312.
CANNABINEÆ, iii. 140.
Cannabis sativa, iii. 140.
CANNEÆ, iii. 311.
Cantua aggregata, iv. 71.
—— *glomeriflora*, ii. 354.
—— *longiflora*, ii. 354.
CAPERONIA, iii. 119.
Caperonia, iv. 231.
Caperonia castaneæfolia, iii. 119.
—— paludosa, iii. 120.
—— palustris, iii. 120.
—— *panamensis*, iii. 120.
CAPPAREÆ, i. 43.
CAPPARIDEÆ, i. 41; iv. 7.
Capparideæ, i. 45; iv. 172, 203, 214, 216, 224.
CAPPARIS, i. 43.
Capparis amplissima, i. 43.
—— amygdalina, i. 43.
—— angustifolia, i. 43.
—— asperifolia, i. 44.
—— avicenniæfolia, i. 44.
—— brevipes, i. 44.
—— brevisiliqua, i. 44.
—— *breynia*, i. 43.
—— cynophallophora, i. 44.
—— frondosa, i. 44.
—— furfuracea, i. 44.
—— incana, i. 44.
—— *intermedia*, i. 44.
—— isthmensis, iv. 7.
—— karwinskiana, i. 44.
—— neriifolia, iv. 7.
—— odoratissima, i. 44.
—— pauciflora, i. 44.
—— subbiloba, i. 44.
—— *torulosa*, i. 44.
—— verrucosa, i. 45.
—— *verrucosa*, i. 43.
CAPRARIA, ii. 454.
Capraria biflora, ii. 455.
—— *biflora*, iv. 105, 113, 231.
—— *cuneata*, ii. 455.
—— *gratioloides*, ii. 453.
—— integrifolia, ii. 455.
—— *mexicana*, ii. 455.
—— saxifragæfolia, ii. 455.
CAPRIFOLIACEÆ, ii. 1; iv. 46, 101.
Caprifoliaceæ, iv. 182, 203, 215, 217, 225, 229, 248.
Caprifolium pilosum, ii. 5.
CAPSELLA, i. 39.
Capsella bursa-pastoris, i. 39.
—— mexicana, i. 39.
—— pubens, iv. 6.
—— schaffneri, iv. 6.
CAPSICUM, ii. 423.
Capsicum, iv. 256.
—— annuum, ii. 423.
—— baccatum, ii. 423; iv. 105.
—— *cerasiforme*, ii. 423.
—— chlorocladum, ii. 423.
—— frutescens, ii. 423; iv. 113.
—— hispidum, ii. 423.
—— *microphyllum*, ii. 423.
—— *milleri*, ii. 423.
CARAGUATA, iii. 318.
Caraguata zahnii, iii. 318.
CARAPA, i. 183.
Carapa nicaraguensis, i. 183.
CARDAMINE, i. 32.
Cardamine affinis, iv. 5.
—— angulata, i. 32; iv. 5.
—— auriculata, iv. 5.
—— *chilensis*, iv. 5.
—— gambelii, iv. 5.
—— hirsuta, var.?, i. 32.
—— schaffneri, i. 32.
—— *schaffneri*, iv. 5.
Cardiacanthus neesianus, ii. 521.
Cardiochlæna macrophylla, iii. 648.
Cardionema multicaule, iii. 10.
Cardiophyllum montanum, iii. 431.
CARDIOSPERMUM, i. 209.
Cardiospermum coluteoides, i. 209.
—— grandiflorum, i. 209.
—— halicacabum, i. 209.
—— hispidum, i. 209.
—— molle, i. 209.
—— pubescens, i. 209.
Cardiostigma longispatha, iii. 328.
Carduus lappoides, ii. 251.
—— *pyrochros*, ii. 251.
—— *pyrochrous*, iv. 148.
—— *subcoriaceus*, ii. 252.
CAREX, iii. 472.
Carex, iv. 149, 213.
Carex acrolepis, iii. 472.
—— acutata, iv. 93.
—— anisostachys, iii. 472.
—— *brongniartii*, iii. 473.
—— chlorocarpos, iii. 473.
—— cladostachya, iii. 472.
—— cordalis, iii. 472.
—— cortesii, iii. 473.
—— *cortesii*, iv. 296.
—— coulteri, iii. 473.
—— *ecklonii*, iv. 94.

Carex ehrenbergiana, iii. 473.
—— enervis, iii. 474.
—— extensa, iv. 93.
—— *extensa*, iv. 94.
—— festiva, iii. 473.
—— *festiva*, iv. 150, 296.
—— *fœnea*, iii. 474.
—— fuscolutea, iv. 94.
—— galeottiana, iii. 473.
—— *galeottiana*, iv. 305.
—— glomerata, iii. 473.
—— *glomerata*, iv. 232.
—— halleriana, iii. 473.
—— hartwegii, iii. 472.
—— *heptastachya*, iii. 473.
—— *hispida*, iv. 94.
—— jamesoni, iii. 473.
—— *jamesoni*, iv. 296.
—— *leporina*, var. *bracteata*, iii. 474.
—— liebmanni, iii. 473.
—— *liebmanni*, iv. 296.
—— longicaulis, iii. 474.
—— maculata, iii. 474.
—— melanosperma, iii. 474.
—— *mexicana*, iii. 472.
—— muehlenbergii, iii. 474.
—— *muricatu*, iii. 473.
—— œrstedii, iii. 474.
—— olivacea, iii. 474.
—— *olivacea*, iv. 296.
—— *oreades*, iii. 473.
—— *orizabæ*, iii. 473.
—— *peruviana*, iv. 94.
—— physorhyncha, iii. 474.
—— *physorhyncha*, iv. 296.
—— *pinetorum*, iii. 473.
—— *planostachys*, iii. 473.
—— *polystachya*, iii. 472.
—— potosina, iii. 474.
—— *propinqua*, iii. 473.
—— *pubescens*, iii. 473.
—— rhyncophysa, iii. 474.
—— rigens, iv. 94.
—— schaffneri, iii. 474.
—— schiedeana, iii. 474.
—— spilocarpa, iii. 474.
—— *spilocarpa*, iv. 296.
—— spissa, iv. 94.
—— straminea, iii. 474.
—— tuberculata, iii. 475.
—— turbinata, iii. 475.
—— viridis, iii. 475.
—— vulpinoides, iii. 475.
—— *xalapensis*, iii. 473.
CARICA, i. 481.
Carica, iv. 245.
Carica boissieri, i. 481.
—— nana, i. 481.
—— papaya, i. 481 ; iv. 112.
—— peltata, i. 481.
CARLUDOVICA, iii. 416.
Carludovica angustifolia, iv. 92.
—— ensiformis, iv. 92.
—— gracilis, iv. 92.
—— microphylla, iii. 416.
—— œrstedii, iii. 416.
—— palmata, iv. 92.
—— plumieri, iv. 92.
—— utilis, iii. 416.
CARMINATIA, ii. 91.
Carminatia tenuiflora, ii. 91.
Carolinea, i. 123, 124.
—— *fastuosa*, i. 124.
CARPHEPHORUS, ii. 108.
Carphephorus revolutifolius, ii. 108.
—— triangularis, ii. 109.
Carphobolus, ii. 75.
CARPINUS, iv. 87.
Carpinus, iv. 260, 263, 309, 312.
—— *americana*, iv. 261, 309.
—— americana, iv. 87.
—— *ostrya*, iii. 166.
CARPOCHÆTE, ii. 108.
Carpochæte bigelovii, ii. 108.
—— *bigelovii*, iv. 141.
—— grahami, ii. 108.
—— wislizeni, ii. 108.
Carpopogon, sp. ?, i. 300.
——, sp. n., iv. 30.
Carroa diffusa, i. 238.
—— *glandulosa*, i. 238.
CARUM, i. 566.
CARYA, iii. 162.
Carya, iv. 309.
—— *alba*, iii. 163.
—— mexicana, iii. 162.
—— olivæformis, iii. 163.
—— *tetraptera*, iii. 163.
Caryophyllaceæ, iv. 173, 203, 214, 224, 234, 236.
CARYOPHYLLEÆ, i. 66; iv. 10.
Caryophylleæ, i. 435 ; iv. 216.
Caryophyllus aromaticus, i. 410.
Caryota urens, iv. 272.
CASEARIA, i. 468.
Casearia aculeata, i. 469.
—— arguta, i. 468.
—— *carpinifolia*, i. 469.
—— corymbosa, i. 468.
—— dentata, i. 468.
—— dubia, i. 469.
—— hirsuta, i. 469.
Casearia hirsuta, i. 468.
—— icosandra, i. 469.
—— nitida, i. 469.
—— obovata, i. 469.
—— parviflora, i. 469.
—— *prunifolia*, i. 469.
—— ramiflora, i. 469.
—— spinosa, i. 469.
—— *sylvestris*, i. 469.
CASEARIEÆ, i. 468.
CASIMIROA, i. 171.
Casimiroa edulis, i. 171.
—— *edulis*, iv. 144.
—— sapota, i. 171.
Casparia dipetala, i. 337.
—— macranthera, i. 338.
—— *pes-capræ*, i. 338.
—— platypetala, i. 339.
—— ramosissima, i. 339.
Casparya, i. 493.
CASSIA, i. 327.
Cassia, iv. 147, 213.
Cassia acapulcensis, i. 328.
—— *æschynomene*, i. 332.
—— alata, i. 327 ; iv. 99.
—— *alcaparillo*, i. 328.
—— andrieuxii, i. 328.
—— *apiculata*, i. 329.
—— *arenaria*, i. 330.
—— argentea, i. 328.
—— *astroites*, i. 335.
—— atomaria, i. 328.
—— bacillaris, i. 328.
—— bauhiniæfolia, i. 334.
—— bauhinioides, i. 328.
—— berlandieri, i. 328.
—— bicapsularis, i. 328.
—— biflora, i. 328.
—— botteriana, i. 329.
—— *brasiliana*, i. 330.
—— brevipes, i. 329.
—— *browniana*, i. 333.
—— *calliantha*, i. 332.
—— calycioides, i. 329.
—— *camporum*, i. 333.
—— *canescens*, i. 330.
—— *caracasana*, i. 331.
—— *chamæchristæ*, var., i. 336.
—— chamæcrista, i. 329.
—— cinerea, i. 329.
—— crotalaroides, i. 329.
—— densiflora, i. 329.
—— diphylla, i. 329.
—— *elegans*, i. 331.
—— *elliptica*, i. 330.
—— emarginata, i. 330; iv. 99.
—— *fabaginæfolia*, i. 334.

Cassia fagifolia, i. 333.
—— *fagonioides*, i. 331.
—— fistula, i. 330.
—— *fistuloides*, i. 330.
—— *flavicoma*, i. 335.
—— flexuosa, i. 330.
—— foliolosa, i. 330.
—— galeottiana, i. 330.
—— *geminiflora*, i. 328.
—— glabrata, i. 328.
—— glandulosa, i. 330.
—— *glandulosa*, i. 335.
—— grammica, i. 330.
—— grandiflora, i. 332.
—— grandis, i. 330.
—— greggii, i. 330.
—— *hartwegii*, i. 333.
—— *herbertiana*, i. 331.
—— *herpetica*, i. 327.
—— hirsuta, i. 331.
—— hispidula, i. 331.
—— *humboldtiana*, i. 334.
—— *humilis*, i. 335.
—— inæquilatera, i. 331.
—— *kunthiana*, i. 335.
—— lævigata, i. 331.
—— *leiantha*, i. 331.
—— leiophylla, i. 331.
—— leptocarpa, i. 331.
—— leucophylla, i. 329.
—— liebmannii, i. 331.
—— lindheimeriana, i. 331.
—— *lotoides*, i. 331.
—— *magnifica*, i. 332.
—— *maritima*, i. 333.
—— mexicana, i. 332.
—— mimosoides, i. 332.
—— *mollissima*, i. 328.
—— moschata, i. 332.
—— multiflora, i. 332.
—— *multiglandulosa*, i. 335.
—— multijuga, i. 332.
—— nicaraguensis, i. 332.
—— nictitans, i. 332.
—— *nutans*, i. 328.
—— occidentalis, i. 332; iv. 112.
—— *ovalifolia*, i. 328.
—— oxyphylla, i. 333; iv. 112.
—— parkeriana, i. 334.
—— patellaria, i. 333.
—— pauciflora, i. 333.
—— pentagonia, i. 333.
—— pilifera, i. 333.
—— polyantha, i. 333.
—— procumbens, i. 333.
—— *propinqua*, i. 330.
—— *prostrata*, i. 334.
Cassia puberula, i. 328.
—— pubescens, i. 331.
—— *pulchella*, i. 329.
—— *pumila*, i. 331.
—— pumilio, i. 333.
—— *punctata*, i. 333.
—— *pygmæa*, i. 333.
—— *ramosissima*, i. 330.
—— reticulata, i. 333.
—— *richardiana*, i. 332.
—— riparia, i. 334.
—— rotundifolia, i. 334; iv. 112.
—— *rusa*, i. 335.
—— *selloi*, i. 332.
—— *sennoides*, i. 328.
—— *sensitiva*, i. 334.
—— sericea, i. 334.
—— serpens, i. 334.
—— skinneri, i. 334.
—— sophera, i. 334.
—— *speciosa*, i. 334.
—— spectabilis, i. 334.
—— stenocarpa, i. 334; iv. 32.
—— *strobilacea*, i. 333.
—— tagera, i. 335.
—— *tarantan*, i. 333.
—— tomentosa, i. 335.
—— tora, i. 335.
—— *triflora*, i, 329.
—— tristicula, i. 335.
—— undulata, i. 335.
—— villosa, i. 335.
—— virgata, i. 335.
—— vogeliana, i. 335; iv. 32.
—— wislizeni, i. 336.
—— wrightii, i. 336.
—— *xiphoidea*, i. 328.
CASSIEÆ, i. 327.
CASSIPOUREA, i. 402.
Cassipourea elliptica, i. 402.
CASSYTHA, iii. 77.
Cassytha, iii. 70.
Cassytha americana, iv. 114.
—— filiformis, iii. 77.
—— *filiformis*, iv. 114.
Castanea, iv. 260.
Castanopsis, iv. 260, **261**.
CASTELA, i. 173.
Castela lychnophoroides, i. 173.
—— nicholsoni, i. 173; iv. 17.
—— retusa, i. 173.
—— tortuosa, i. 173.
Castigliona lobata, iii. 107.
CASTILLEJA, ii. 459.
Castilleja, ii. 463; iv. 150, 151, 213, 229, 257, 305.
Castilleja affinis, ii. 460.
Castilleja angustifolia, ii. 460.
—— *anthemidifolia*, ii. 463.
—— arvensis, ii. 460.
—— *arvensis*, iv. 148.
—— canescens, ii. 460.
—— communis, ii. 460.
—— fissifolia, ii. 460.
—— *fissifolia*, iv. 291.
—— gracilis, ii. 460.
—— hirsuta, ii. 460.
—— integra, ii. 461.
—— integrifolia, ii. 461.
—— *integrifolia*, iv. 149.
—— irasuensis, ii. 461.
—— *irasuensis*, iv. 157, 159, 291.
—— lanata, ii. 461.
—— laxa, ii. 461.
—— linariæfolia, ii. 461.
—— lithospermoides, ii. 461.
—— *lithospermoides*, ii. 460; iv. 291, 292.
—— longibracteata, ii. 461.
—— longiflora, ii. 461.
—— moranensis, ii. 462.
—— *moranensis*, iv. 292.
—— *obovata*, ii. 460.
—— *orizabæ*, ii. 462.
—— pallida, ii. 462.
—— pectinata, ii. 462.
—— *pectinata*, iv. 292.
—— schaffneri, ii. 462.
—— scorzoneræfolia, ii. 462.
—— *scorzoneræfolia*, iv. 149.
—— sessiliflora, ii. 463.
—— *speciosa*, ii. 462.
—— tenuiflora, ii. 463.
—— tenuifolia, ii. 463.
—— *tenuifolia*, iv. 292.
—— tolucensis, ii. 463.
—— *tolucensis*, iv. 292.
—— *tomentosa*, ii. 461.
CASTILLOA, iii. 149.
Castilloa costaricana, iii. 149.
—— elastica, iii. 149.
—— *elastica*, iv. 300.
—— markhamiana, iii. 149.
Casuarinæ, iii. 165.
Casuarineæ, iv. 194.
Catachætum, iii. 260.
CATASETUM, iii. 260.
Catasetum, iii. 261, 262, 263 iv. 152, 382.
Catasetum dilectum, iii. 260.
—— hookeri, iii. 260.
—— *integerrimum*, iii. 261.
—— laminatum, iii. 260.

Catasetum laminatum, var. *eburneum*, iii. 260.
—— maculatum, iii. 260.
—— œrstedii, iii. 261.
—— russellianum, iii. 261.
—— *serratum*, iii. 261.
—— *triste*, iii. 260.
—— viridiflavum, iii. 261.
—— *waitesii*, iii. 261.
—— warscewiczii, iii. 261.
CATESBÆA, ii. 38.
Catesbæa erecta, ii. 38.
CATESBÆEÆ, ii. 38.
Cathartocarpus brasilianus, i. 330.
Cathestechum, iii. 517.
CATHESTECUM, iii. 517.
Cathestecum erectum, iii. 517.
—— prostratum, iii. 517.
Catoferia, ii. 541.
CATOPHERIA, ii. 541.
Catopheria capitata, ii. 541.
—— chiapensis, ii. 541.
CATOPSIS, iii. 324.
Catopsis parviflora, iii. 319.
CATTLEYA, iii. 243.
Cattleya citrina, iii. 243.
—— *citrina*, iv. 295, 304, 305.
—— *deckeri*, iii. 244.
—— dowiana, iii. 244.
—— *grahami*, iii. 247.
—— granulosa, iii. 244.
—— *karwinskii*, iii. 243.
—— labiata, iii. 244.
—— *lemoniana*, iii. 244.
—— *lüddemanniana*, iii. 244.
—— *mossiæ*, iii. 244.
—— *pallida*, iii. 244.
—— skinneri, iii. 244.
—— ——, var. *parviflora*, iii. 244.
—— *trianæi*, iii. 244.
—— *wagneri*, iii. 244.
—— *warscewiczii*, iii. 244.
CAUCALINEÆ, i. 570.
Caucalis, i. 570.
—— *microcarpa*, i. 571.
CAVANILLESIA, i. 126.
Cavanillesia, iv. 237.
Cavanillesia platanifolia, i. 126.
CAVENDISHIA, ii. 272.
Cavendishia, iv. 254.
Cavendishia acuminata, ii. 272.
—— complectens, ii. 272.
—— crassifolia, ii. 273.
—— endresii, ii. 273.
—— latifolia, ii. 273.
—— laurifolia, ii. 273.
Cavendishia melastomoides, ii. 273.
—— pubescens, ii. 273.
—— veraguensis, ii. 273.
—— warscewiczii, ii. 274.
CAYAPONIA, iv. 40.
Cayaponia, iv. 231.
Cayaponia alata, iv. 41.
—— americana, iv. 41.
—— ——, var. œrstedii, iv. 41.
—— attenuata, iv. 41.
—— grandiflora, iv. 41.
—— heterophylla, iv. 41.
—— maximowiczii, iv. 41.
—— racemosa, iv. 41.
—— ——, var. microcarpa, iv. 41.
—— ——, var. palmatipartita, iv. 41.
—— ——, var. scaberrima, iv. 41.
CEANOTHUS, i. 199.
Ceanothus alamani, i. 200.
—— azureus, i. 199; iv. 22.
—— *azureus*, iv. 283.
—— buxifolius, i. 199.
—— *buxifolius*, iv. 283.
—— cæruleus, i. 199.
—— *cæruleus*, iv. 22.
—— *celtidifolius*, i. 200.
—— depressus, i. 199.
—— glandulosus, i. 199.
—— greggii, i. 199.
—— *infestus*, i. 201.
—— macrocarpus, i. 199.
—— moçinianus, i. 200.
—— pauciflorus, i. 200.
CECROPIA, iii. 150.
Cecropia, iv. 300.
Cecropia commutata, iii. 151.
—— humboldtiana, iii. 151.
—— insignis, iii. 151.
—— mexicana, iii. 151.
—— obtusifolia, iii. 151.
—— panamensis, iii. 151.
—— *peltata*, iv. 162.
—— propinqua, iii. 152.
—— schiedeana, iii. 152.
—— *strigosa*, iii. 152.
CEDRELA, i. 184.
Cedrela, iv. 156.
Cedrela alternifolia, i. 184.
—— angustifolia, i. 184.
—— glaziovii, i. 184.
—— mexicana, i. 184.
—— *odorata*, i. 184; iv. 157.
CEDRELEÆ, i. 184.
CEDRONELLA, ii. 568.
Cedronella, iv. 231.
Cedronella breviflora, iv. 81.
—— hastifolia, ii. 568.
—— mexicana, ii. 568.
—— pallida, ii. 568.
Cedrus alternifolia, i. 184.
CELASTREÆ, i. 188.
CELASTRINEÆ, i. 187; iv. 21, 98.
Celastrineæ, iv. 177, 203, 215, 217, 224.
CELASTRUS, i. 188.
Celastrus aphyllus, i. 188.
—— mexicanus, i. 188.
CELOSIA, iii. 12.
Celosia moquini, iii. 12.
—— *nitida*, iii. 12.
—— nitida, iv. 114.
—— palmeri, iv. 82.
—— paniculata, iii. 12.
—— *procumbens*, iii. 19.
—— *tomentosa*, iii. 13.
—— virgata, iii. 12.
—— *virgata*, iv. 82.
CELTIDEÆ, iii. 138.
CELTIS, iii. 138.
Celtis, iv. 309.
Celtis aculeata, iii. 138.
—— alba, iii. 139.
—— anfractuosa, iii. 139.
—— berlandieri, iii. 139; iv. 87.
—— *canescens*, iii. 140.
—— caudata, iii. 139.
—— *ehrenbergiana*, iii. 138.
—— *epiphylladena*, iii. 138.
—— lævigata, iii. 139.
—— *littoralis*, iii. 139.
—— *micrantha*, iii. 140.
—— monoica, iii. 139.
—— *orthacanthus*, iii. 139.
—— *pallida*, iii. 140; iv. 140.
—— *schiedeana*, iii. 140.
—— tala, iii. 139.
—— *tala*, iii. 140.
—— *texana*, iii. 139.
CENCHRUS, iii. 506.
Cenchrus brevisetus, iii. 506.
—— echinatus, iii. 506.
—— *lævigatus*, iii. 518.
—— multiflorus, iii. 506.
—— myosuroides, iii. 507.
—— pallidus, iii. 507.
—— pilosus, iii. 507.
—— pungens, iii. 507.
—— roseus, iii. 507.
—— tribuloides, iii. 507.
—— *tribuloides*, iv. 279.
CENTAUREA, ii. 253.

Centaurea americana, ii. 253.
—— *mexicana*, ii. 253.
—— *nuttallii*, ii. 253.
CENTRADENIA, i. 415.
Centradenia, iv. 163, 242.
Centradenia floribunda, i. 415.
—— grandifolia, i. 415.
—— inæquilateralis, i. 415.
—— *rosea*, i. 415.
CENTRATHERUM, ii. 70.
Centratherum punctatum, ii. 70.
Centrolepideæ, iv. 199.
CENTRONIA, i. 421.
Centronia phlomoides, i. 421.
CENTROPOGON, ii. 264.
Centropogon, iv. 253.
Centropogon affinis, ii. 264.
—— *affinis*, iv. 289.
—— bacillaris, ii. 328.
—— *cordatus*, ii. 264.
—— cordifolius, ii. 264.
—— costaricanus, iv. 66.
—— *costaricanus*, iv. 159.
—— fastuosus, ii. 264.
—— grandis, ii. 264.
—— longipes, ii. 264.
—— nutans, iv. 66.
—— scandens, iv. 66.
—— surinamensis, ii. 264.
—— *virescens*, iv. 66.
—— warscewiczii, ii. 264.
Centrosema, iv. 230.
Centrosema angustifolium, i. 294.
—— brevifolium, i. 294.
—— dubium, i. 294.
—— *grandiflorum*, i. 294.
—— *molle*, i. 294.
—— pascuorum, i. 294.
—— plumieri, i. 294.
—— pubescens, i. 294.
—— *pubescens*, i. 295.
—— *salzmannii*, i. 294.
—— virginianum, i. 294; iv. 99.
—— *virginianum*, iv. 230.
Centrospermum humile, ii. 147.
CENTUNCULUS, ii. 288.
Centunculus minimus, ii. 289.
—— pentandrus, ii. 289.
CEPHAELIS, ii. 53.
Cephaelis discolor, ii. 53.
—— hirsuta, ii. 53.
—— psychotriæfolia, ii. 53.
—— punicea, ii. 53.
—— *reniformis*, ii. 54.
—— tomentosa, ii. 53.
CEPHALANTHUS, ii. 6.
Cephalanthus occidentalis, ii. 6.
—— salicifolius, ii. 6.
Cephalocarpus, iii. 468.
Cephalophora anthemoides, ii. 228.
Cephaloschœnus marginatus, iii. 466.
Cephalotus, i. 91.
Ceramanthus luridus, ii. 319.
CERASTIUM, i. 67.
Cerastium, iv. 149.
Cerastium andinum, i. 67.
—— *andinum*, iv. 10, 283.
—— *angustifolium*, i. 67.
—— *apricum*, i. 67.
—— *brachycarpum*, i. 67.
—— cuspidatum, i. 67.
—— fasciculatum, i. 67.
—— molle, i. 67; iv. 10.
—— nutans, i. 67.
—— orithales, i. 68.
—— *orithales*, iv. 150, 283.
—— ramigerum, i. 68.
—— *semidecandrum*, iv. 10.
—— sericeum, iv. 10.
—— triviale, i. 68.
—— vulcanicum, i. 68; iv. 10.
—— *vulcanicum*, iv. 150, 283.
Cerasus capollin, i. 367; iv. 303.
—— *capuli*, i. 367.
—— *demissa*, i. 368.
Ceratochilus grandiflorus, iii. 257.
—— *oculatus*, iii. 257, 258.
—— *ruckeri*, iii. 257.
Ceratochloa unioloides, iii. 584.
Ceratodactylis osmundoides, iii. 617.
Ceratophyllaceæ, iv. 215.
CERATOPHYLLEÆ, iii. 181; iv. 194, 205, 217.
CERATOPHYLLUM, iii. 182.
Ceratophyllum demersum, iii. 182.
CERATOPTERIS, iii. 625.
Ceratopteris calomelanos, iii. 676.
—— *pallescens*, iii. 679.
—— *plicata*, iii. 676.
—— *schaffneri*, iii. 676.
—— *serrata*, iii. 676.
—— tartarea, iii. 679.
—— thalictroides, iii. 625.
—— trifoliata, iii. 679.
CERATOZAMIA, iii. 192.
Ceratozamia brevifrons, iii. 192.
—— *fusca-viridis*, iii. 193.
—— *ghiesbreghtii*, iii. 192.
—— *intermedia*, iii. 193.
—— *karsteniana*, iii. 192.
—— küsteriana, iii. 193.
—— latifolia, iii. 192.
Ceratozamia latifolia, var. *minor*, iii. 193.
—— *longifolia*, iii. 193.
—— mexicana, iii. 192.
—— ——, var. longifolia, iii. 193.
—— *mexicana*, iii. 191.
—— miqueliana, iii. 192.
—— robusta, iii. 193.
—— tenuis, iii. 193.
Cerbera cuneifolia, ii. 307.
—— *odollam*, iv. 233.
—— *ovata*, ii. 307.
—— *thevetia*, ii. 307.
—— *thevetioides*, ii. 307.
CERCIDIUM, i. 326.
Cercidium floridum, i. 327.
—— *spinosum*, var., i. 327.
CERCIS, i. 340.
Cercis californica, i. 340.
—— occidentalis, i. 340.
—— *occidentalis*, var. *texensis*, iv. 32.
—— reniformis, iv. 32.
CERCOCARPUS, i. 373.
Cercocarpus, iv. 240.
—— *betulæfolius*, i. 374.
—— *betuloides*, i. 374.
—— breviflorus, i. 373.
—— fothergilloides, i. 373.
—— parvifolius, i. 374.
—— *parvifolius*, iv. 142.
CERDIA, i. 76.
Cerdia, iv. 120, 236.
Cerdia congestiflora, i. 76; iv. 11.
—— glauca, i. 77; iv. 11.
—— purpurascens, i. 77; iv. 11.
—— virescens, i. 77.
Ceresia fluitans, iii. 479.
CEREUS, i. 540.
Cereus, iii. 89; iv. 140, 141, 213, 233, 245, 246, 247.
—— *aciniformis*, i. 541.
—— *ackermanni*, i. 547.
—— acutangulus, i. 540.
—— adustus, i. 540.
—— amœnus, i. 540.
—— anisacanthus, i. 540.
—— armatus, i. 544.
—— *bacciferus*, i. 548.
—— baxaniensis, i. 540.
—— benekei, i. 540.
—— bifrons, i. 540.
—— *bifrons*, i. 541.
—— brachiatus, i. 540.
—— cæspitosus, i. 541.
—— callicoche, i. 541.
—— calvescens, i. 541.

Cereus castaneus, i. 541.
—— chrysomallus, i. 541.
—— cinerascens, i. 541; iv. 44.
—— cirrhiferus, i. 541.
—— cismontanus, i. 543.
—— claviformis, i. 541.
—— coccineus, i. 541.
—— *coccineus*, i. 540.
—— columna-trajani, i. 541.
—— conformis, i. 541.
—— conicus, i. 542.
—— crassior, i. 541.
—— *crenatus*, i. 548.
—— ctenoides, i. 542.
—— *deppei*, i. 541.
—— dichroacanthus, i. 542.
—— dubius, i. 542.
—— dyckii, i. 542.
—— ehrenbergii, i. 542.
—— emoryi, i. 542.
—— engelmanni, i. 542.
—— enneacanthus, i. 542.
—— erectus, i. 542.
—— euphorbioides, i. 542.
—— *exerens*, i. 547.
—— fendleri, i. 542.
—— flagelliformis, i. 542.
—— *flagelliformis*, iv. 148.
—— flagriformis, i. 543.
—— flavescens, i. 543.
—— *formosus*, i. 546.
—— gemmatus, i. 543.
—— geometrizans, i. 543.
—— giganteus, i. 543.
—— *giganteus*, iv. 142.
—— gladiator, i. 543.
—— greggii, i. 543.
—— *greggii*, iv. 142.
—— *hæmatus*, i. 545.
—— *imbricatus*, i. 551.
—— *latifrons*, i. 548.
—— leeanus, i. 543.
—— *leptacanthus*, i. 544.
—— leptophis, i. 543.
—— linnæi, iv. 44.
—— longisetus, i. 543.
—— macdonaldiæ, i. 544.
—— *macdonaldiæ*, iv. 101.
—— major, i. 541.
—— marginatus, i. 544.
—— maritimus, iv. 45.
—— martianus, i. 544.
—— micranthus, i. 544.
—— minor, i. 541.
—— napoleonis, i. 544.
—— nycticalus, i. 544.
—— *nycticalus*, iv. 101.
Cereus oxypetalus, i. 548.
—— pectinatus, i. 544.
—— pentalophus, i. 544.
—— *phyllanthoides*, i. 548.
—— *phyllanthus*, i. 548.
—— *pitajaya*, i. 547; iv. 162.
—— polyacanthus, i. 545.
—— polylophus, i. 545.
—— pottsii, i. 545.
—— pringlei, iv. 45.
—— procumbens, i. 544.
—— *propinquus*, i. 544.
—— *pruinosus*, i. 536.
—— *pterandrus*, i. 544.
—— pterogonus, i. 545.
—— pugioniferus, i. 543.
—— pulchellus, i. 545.
—— quadrangulispinus, i. 545.
—— ramosus, i. 545.
—— reductus, i. 531.
—— *reductus*, i. 531.
—— rigidispinus, i. 545.
—— rigidissimus, i. 544.
—— rostratus, i. 545.
—— rufispinus, i. 545.
—— salm-dyckianus, i. 545.
—— scheerii, i. 546.
—— schottii, i. 546.
—— schrankii, i. 546.
—— senilis, i. 546.
—— *senilis*, iv. 127.
—— serpentinus, i. 546.
—— similis, i. 546.
—— spachianus, i. 546.
—— speciosissimus, i. 546.
—— *speciosissimus*, var. *lateritius*, i. 546.
—— spinulosus, i. 546.
—— stellatus, i. 546.
—— stramineus, i. 546.
—— *stramineus*, iv. 142.
—— subinermis, i. 546.
—— superbus, i. 546.
—— tenuior, i. 541.
—— thurberi, i. 547.
—— *tilophorus*, i. 547.
—— transmontanus, i. 543.
—— triangularis, i. 547.
—— *triangularis*, var. *major*, i. 544.
—— tuberosus, i. 547.
—— *tubiflorus*, i. 539.
—— *undatus*, i. 544.
—— *undulosus*, i. 547.
—— variabilis, i. 547.
—— virens, i. 547.
CESPEDESIA, i. 177.
Cespedesia macrophylla, i. 177.
CESTRUM, ii. 430.
Cestrum, iv. 213, 256.
Cestrum alaternoides, ii. 430.
—— amygdalifolium, ii. 430.
—— anagyris, ii. 430.
—— aurantiacum, ii. 430.
—— *aurantiacum*, iv. 76.
—— benthami, ii. 430.
—— billbergianum, ii. 431.
—— candidum, ii. 431.
—— *cauliflorum*, ii. 424.
—— confertiflorum, ii. 431.
—— diurnum, iv. 105, 113.
—— dumetorum, ii. 431.
—— ehrenbergii, ii. 431.
—— elegans, ii. 431.
—— endlicheri, ii. 431.
—— fasciculatum, ii. 431.
—— *fasciculatum*, ii. 432.
—— *fœtidissimum*, ii. 433; iv. 76.
—— graciliflorum, ii. 431.
—— hartwegi, ii. 432.
—— *hartwegi*, ii. 431.
—— hirtellum, ii. 432.
—— hirtum, ii. 432.
—— involucratum, ii. 432.
—— lævigatum, ii. 432.
—— lanatum, ii. 432.
—— lancifolium, ii. 432.
—— laxum, ii. 432.
—— macrophyllum, ii. 432.
—— *megalophyllum*, ii. 432.
—— multinervium, ii. 432; iv. 76.
—— nitidum, ii. 432.
—— *nitidum*, iv. 291.
—— nocturnum, ii. 433; iv. 76.
—— oblongifolium, ii. 433.
—— *paniculatum*, ii. 433.
—— *parqui*, ii. 434.
—— pedunculare, ii. 433.
—— persicæfolium, ii. 433.
—— phyllobotryon, ii. 431.
—— propinquum, ii. 433.
—— psychotriæfolium, ii. 433.
—— regelii, ii. 433.
—— roseum, ii. 433.
—— scandens, ii. 433.
—— semivestitum, ii. 433.
—— sylvaticum, ii. 433.
—— terminale, ii. 434.
—— thyrsoideum, ii. 434.
—— vespertinum, ii. 434.
—— viride, ii. 434.
—— warscewiczii, iv. 76.
CEVALLIA, i. 471.
Cevallia sinuata, i. 472; iv. 38.
—— *sinuata*, iv. 141.

Chaboissæa ligulata, iii. 588.
Chærophyllum, iv. 149.
Chætaria bromoides, iii. 535.
—— *capillacea*, iii. 532.
—— *capillaris*, iii. 532.
—— *coarctata*, iii. 535.
—— *glauca*, iii. 533, 534.
—— *interrupta*, iii. 533.
—— *setifolia*, iii. 535.
—— *stricta*, iii. 535.
Chæthymenia peduncularis, ii. 209.
CHÆTIUM, iii. 503.
Chætium bromoides, iii. 503.
CHÆTOCALYX, i. 268.
Chætocalyx latisiliqua, i. 268.
—— schottii, i. 268; iv. 28.
—— wislizeni, i. 268.
—— *wislizeni*, iv. 28.
Chætocyperus acicularis, iii. 454.
—— *depauperatus*, iii. 455.
—— *niveus*, iii. 455.
—— *polymorphus, a. depauperatus*, iii. 454.
—— *stoloniferus*, iii. 457.
—— *trichoides*, iii. 455.
—— *urceolatus*, iii. 454.
—— *viviparus*, iv. 157.
Chætogastra lanceolata, i. 418.
—— *scabriuscula*, i. 419.
Chætoptelea mexicana, iii. 138.
Chætospora aurea, iii. 464, 465.
—— *ferruginea*, iii. 465.
—— *mexicana*, iii. 138.
—— *triceps*, iii. 466.
CHÆTOTHYLAX, ii. 515.
Chætothylax longiflora, ii. 521.
—— micrantha, ii. 515.
—— phyllostachya, ii. 515.
Chætothylopsis micrantha, ii. 515.
Chæturus divaricatus, iii. 533.
CHAILLETIA, iv. 21.
Chailletia, i. 184.
CHAILLETIACEÆ, iv. 24.
Chailletiaceæ, iv. 176, 205, 216.
Chakiatella platyglossa, ii. 167.
Chalarium amplifolium, i. 274.
—— callilepis, i. 276.
—— campyloclados, i. 276.
—— foliosum, i. 278.
—— ghiesbreghtii, i. 279.
—— hartwegianum, i. 279.
—— macropodium, i. 281.
—— madrense, i. 282.
—— nitidum, i. 283.
—— palmeri, i. 284.
—— parkinsoni, i. 285.
—— parryi, i. 285.
Chalarium plectocarpum, i. 286.
—— subtile, i. 290.
Chamæcyparis thurifera, iii. 183; iv. 144.
CHAMÆDOREA, iii. 402.
Chamædorea, iv. 146, 147, 152, 155, 213, 262, 264, 276, 277, 299, 300, 314.
Chamædorea affinis, iii. 403.
—— alternans, iii. 403.
—— arenbergiana, iii. 403.
—— atrovirens, iv. 91.
—— brachyclada, iii. 403.
—— bracteata, iii. 403.
—— casperiana, iii. 403.
—— cataractarum, iii. 403.
—— *cataractarum*, iv. 276.
—— costaricana, iii. 403.
—— bifurcata, iii. 403.
—— deckeriana, iii. 404.
—— desmoncoides, iii. 404.
—— elatior, iii. 404.
—— *elatior*, iii. 405.
—— elegans, iii. 404.
—— ernesti-augusti, iii. 404.
—— *fibrosa*, iii. 407.
—— *friedrichsthaliana*, iv. 165.
—— geonomæformis, iii. 404.
—— glaucifolia, iii. 404.
—— graminifolia, iii. 304.
—— humilis, iii. 404.
—— *humilis*, iv. 276.
—— karwinskiana, ii. 405.
—— klotzschiana, iii. 405.
—— lepidota, iii. 405.
—— liebmannii, iii. 405.
—— lindeniana, iii. 405.
—— lunata, iii. 405.
—— macrospadix, iii. 405.
—— martiana, iii. 405.
—— membranacea, iii. 405.
—— microphylla, iii. 406.
—— montana, iii. 406.
—— oreophila, iii. 406.
—— pacaya, iii. 406.
—— *pacaya*, iv. 167, 276.
—— paradoxa, iii. 406.
—— pochutlensis, iii. 406.
—— pygmæa, iii. 406.
—— radicalis, iii. 406.
—— resinifera, iii. 406.
—— sartorii, iii. 406.
—— *scandens*, iii. 404.
—— schiedeana, iii. 407.
—— tenella, iii. 407.
—— *tenella*, iv. 276.
—— tepejilote, iii. 407.
Chamædorea warscewicziana, iii. 407.
—— wendlandiana, iii. 407.
Chamædorella brachyclada, iii. 403.
—— lepidota, iii. 405.
—— microphylla, iii. 406.
Chamædoropsis affinis, iii. 403.
—— costaricana, iii. 403.
—— desmoncoides, iii. 404.
—— elatior, iii. 404.
—— graminifolia, iii. 404.
—— karwinskiana, iii. 405.
—— lindeniana, iii. 405.
—— lunata, iii. 405.
—— macrospadix, iii. 405.
—— membranacea, iii. 405.
—— paradoxa, iii. 406.
—— pochutlensis, iii. 406.
—— radicalis, iii. 406.
—— resinifera, iii. 406.
—— schiedeana, iii. 407.
Chamæmeles mexicana, i. 380.
Chamærops, iv. 147, 276.
—— *mocinni*, iii. 411.
CHAMÆSARACHA, ii. 421.
Chamæsaracha coronopus, i. 421.
—— sordida, ii. 421.
CHAMISSOA, iii. 13.
Chamissoa altissima, iii. 12.
—— altissima, iii. 13; iv. 114.
—— macrocarpa, iii. 13.
Chaptalea tomentosa, iv. 253.
CHAPTALIA, ii. 255.
Chaptalia ehrenbergii, ii. 255.
—— lyrata, ii. 255.
—— nutans, ii. 255.
—— seemannii, ii. 255.
—— spathulata, ii. 255.
Chascolytrum rotundatum, iii. 579.
—— *subaristatum*, iii. 579.
CHEILANTHES, iii. 613.
Cheilanthes, iii. 617; iv. 140, 149, 281, 282.
—— *affinis*, iii. 672.
—— *alabamensis*, iii. 615, 618.
—— allosuroides, iii. 613.
—— *angustifolia*, iii. 618.
—— *aschenborniana*, iii. 672.
—— *aspidioides*, iii. 615.
—— aurantiaca, iii. 613.
—— aurea, iii. 613.
—— *brachypus*, iii. 673.
—— *bradburii*, iii. 617.
—— *californica*, iii. 612.
—— *candida*, iii. 673.
—— *canescens*, iii. 595.
—— *chærophylla*, iii. 620.
—— *chærophylloides*, iii. 620.

Cheilanthes cheiloglyphis, iii. 613.
—— *ciliata*, iii. 620.
—— cinnamomea, iii. 613.
—— clevelandi, iii. 613.
—— cooperæ, iii. 614.
—— *cretacea*, iii. 673.
—— *cucullans*, iii. 615.
—— *cuneata*, iii. 618.
—— *dealbata*, iii. 673.
—— *decomposita*, iii. 618.
—— *eatoni*, iii. 613, 617.
—— *elegans*, iii. 615.
—— *elongata*, iii. 615.
—— farinosa, iii. 614.
—— *farinosa*, iv. 297.
—— fendleri, iii. 614.
—— *ferruginea*, iii. 674.
—— *glandulifera*, iii. 615.
—— *glauca*, iii. 619.
—— gracillima, iii. 614.
—— *hirsuta*, iii. 614.
—— *intramarginalis*, iii. 620.
—— *lanuginosa*, iii. 614.
—— lendigera, iii. 614; iv. 116.
—— *lendigera*, iv. 297, 298.
—— leucopoda, iii. 615; iv. 95.
—— lindheimeri, iii. 615.
—— *marginata*, iii. 620.
—— meifolia, iii. 615.
—— *micromera*, iii. 615.
—— microphylla, iii. 615.
—— *microphylla*, iv. 298.
—— *minor*, iii. 614.
—— *mollis*, iii. 674.
—— *monosticha*, iii. 673.
—— *moritziana*, iii. 615.
—— myriophylla, iii. 615.
—— *ochracea*, iii. 613.
—— *paleacea*, iii. 616.
—— *parallelogramma*, iii. 612.
—— *pubescens*, iii. 615.
—— *pulveracea*, iii. 614.
—— *pygmæa*, iii. 615.
—— *pyramidalis*, iii. 620.
—— radiata, iii. 616.
—— *radula*, iii. 612.
—— *repens*, iii. 613.
—— *rigida*, iii. 621.
—— *scabra*, iii. 612.
—— scariosa, iii. 616.
—— *scariosa*, iv. 298.
—— *seemanni*, iii. 615.
—— speciosissima, iii. 616.
—— *speciosissima*, iv. 298.
—— *squamosa*, iii. 673.
—— ——, var. *brachypus*, iii. 673.
—— *tenuis*, iii. 617.
Cheilanthes tomentosa, iii. 616.
—— *tomentosa*, var. *extoni*, iii. 616.
—— *venusta*, var. *aurea*, iii. 618.
—— *vestita*, iii. 614.
—— viscosa, iii. 617.
—— wrightii, iii. 617.
Cheilopecton rigidum, iii. 621.
Cheiranthodendrum, iv. 238.
—— *pentadactylon*, iv. 238.
Cheiroglossa palmata, iii. 697.
CHEIROSTEMON, i. 129.
Cheirostemon, iv. 118, 154, 237, 313.
Cheirostemon platanoides, 129.
—— *platanoides*, iv. 283.
Chelone angustifolia, ii. 444.
—— *atropurpurea*, ii. 444.
—— *barbata*, ii. 443.
—— *campanulata*, ii. 444.
—— *campanuloides*, ii. 444.
—— *elegans*, ii. 444.
—— *gentianoides*, ii. 444; iv. 149.
—— *imberbis*, ii. 445.
—— *rosea*, ii. 444.
—— *ruellioides*, ii. 443.
CHENOPODIACEÆ, iii. 22; iv. 83.
Chenopodiaceæ, iv. 190, 203, 215, 217, 225.
Chenopodina linearis, iii. 27.
—— *moquini*, iii. 27.
CHENOPODIUM, iii. 22.
Chenopodium album, iii. 23.
—— ambrosioides, iii. 23; iv. 114.
—— *ambrosioides*, iv. 149.
—— berlandieri, iii. 23; iv. 83.
—— bipinnatifidum, iii. 23.
—— botrys, iii. 23.
—— cornutum, iii. 23.
—— *effusum*, iii. 23.
—— fœtidum, iii. 23.
—— fremontii, iii. 23; iv. 83.
—— *glaucum*, iii. 24.
—— *graveolens*, iii. 23.
—— incisum, iii. 24.
—— *maritimum*, iii. 26.
—— mexicanum, iii. 24.
—— *murale*, iii. 24.
—— *petiolare*, iii. 8.
—— *schraderianum*, iii. 23.
—— stellatum, iv. 83.
Chichæa, i. 126.
CHILERANTHEMUM, ii. 524.
Chileranthemum trifidum, ii. 524.
Chiliophyllum globosum, ii. 159.
Chiloglossa glabra, ii. 518.
CHILOPSIS, ii. 494.
Chilopsis linearis, ii. 494; iv. 141.
—— saligna, ii. 494.
CHIMAPHILA, ii. 283.
Chimaphila, iv. 254, 304.
—— *corymbosa*, ii. 283.
—— maculata, ii. 283.
—— *maculata*, iv. 148.
—— umbellata, ii. 283; iv. 67.
—— *umbellata*, iv. 290.
CHIOCOCCA, ii. 44.
Chiococca coriacea, ii. 44.
—— macrocarpa, ii. 44.
—— phænostemon, ii. 44.
—— racemosa, ii. 44; iv. 102.
—— staminea, ii. 44.
CHIOCOCCEÆ, ii. 43.
CHIONE, ii. 45.
Chione glabra, ii. 45.
CHIONOLÆNA, ii. 134.
Chionolæna corymbosa, ii. 134.
—— lavandulacea, ii. 134.
—— *lavandulacea*, iv. 288.
CHITONIA, i. 159.
Chitonia caudata, i. 425.
—— mexicana, i. 159.
Chlænaceæ, iv. 174.
Chlamydostylus cernuus, iii. 329.
—— *multiflorus*, iii. 328.
—— *tenuis*, iii. 329.
—— *triflorus*, iii. 329.
Chlamysperma arenarioides, ii. 213.
—— *pratense*, ii. 213.
CHLIDANTHUS, iii. 332.
Chlidanthus ehrenbergii, iii. 332.
Chloidia, iii. 296.
—— *flava*, iii. 297.
CHLORANTHACEÆ, iii. 66.
Chloranthaceæ, iv. 205.
CHLORIDEÆ, iii. 557.
CHLORIS, iii. 558.
Chloris alba, iii. 558.
—— andropogonoides, iii. 558.
—— anophia, iii. 558.
—— ciliata, iii. 558.
—— *curtipendula*, iii. 563.
—— *dubia*, iii. 569.
—— elegans, iii. 558.
—— *gracilis*, iii. 559.
—— inermis, iii. 559.
—— petræa, iii. 559; iv. 114.
—— *petræa*, iv. 232.
—— *poæformis*, iii. 566.
—— *polystachya*, iii. 559, 566.
—— radiata, iii. 559.
—— submutica, iii. 559.
—— virgata, iii. 559.

Chlorocaulon, iii. 119.
Chlorogalum, iii. 374.
Chloroleucum elachistophyllum, iv. 33.
—— palmeri, i. 360.
—— schaffneri, iv. 33.
CHLOROPHORA, iii. 140.
Chlorophora, iv. 231.
Chlorophora chlorocarpa, iii. 141.
—— subintegerrima, iii. 141.
—— tinctoria, iii. 141.
—— xanthoxylon, iii. 141.
CHOISYA, i. 168.
Choisya ternata, i. 168.
—— *ternata*, iv. 302, 303.
CHOMELIA, ii. 43.
Chomelia filipes, ii. 43.
—— tenuiflora, ii. 43.
Chondrilla pauciflora, ii. 261.
—— *sessæana*, ii. 261.
CHONDROSIUM, iii. 564.
Chondrosium, iii. 560.
—— *aschenborinanum*, iii. 362.
—— exile, iii. 564.
—— *fœnum*, ii. 562.
—— *gracile*, iii. 562.
—— *hirtum*, iii. 562.
—— *humboldtianum*, iii. 561.
—— *humile*, iii. 562.
—— karwinskii, iii. 564.
—— *microstachyum*, iii. 562.
—— *oligostachyum*, iii. 562.
—— *parryi*, iii. 562.
—— *polystachyum*, iii. 562.
—— *scorpioides*, iii. 563.
—— *tenue*, iii. 563.
—— ——, var., iii. 563.
—— virletii, iii. 564.
Choretis glauca, iii. 335.
Chorisanthera tenera, ii. 482.
CHORISIA, i. 125.
Chorisia, iv. 163, 237.
Chorisia rosea, i. 126.
Choristes, ii. 26.
—— *cornifolia*, ii. 26.
—— *obtusiflora*, ii. 27.
CHORIZANTHE, iii. 33.
Chorizanthe, iv. 259.
Chorizanthe brevicornu, iii. 33.
CHROMOLEPIS, ii. 167.
Chromolepis heterophylla, ii. 167.
CHRYSACTINIA, ii. 224.
Chrysactinia mexicana, ii. 224.
CHRYSANTHELLUM, ii. 204.
Chrysanthellum integrifolium, ii. 204.
—— procumbens, ii. 204.
Chrysanthemum coronarium, ii. 230.
—— *segetum*, iv. 149.
Chryseis, i. 27.
CHRYSOBALANEÆ, i. 365.
CHRYSOBALANUS, i. 365.
Chrysobalanus, iv. 230.
Chrysobalanus ellipticus, i. 365.
—— *ellipticus*, iv. 230.
—— *guianensis*, i. 365.
—— icaco, i. 365; iv. 33, 112.
—— *icaco*, iv. 230.
—— *pellocarpus*, i. 365.
CHRYSOCHLAMYS, i. 87.
Chrysochlamys costa-ricana, i. 87.
—— glauca, i. 87.
—— membranacea, i. 87.
—— nicaraguensis, i. 87.
—— psychotriæfolia, i. 87.
Chrysodium aureum, iii. 683.
—— *cayennense*, iii. 683.
—— crinitum, iii. 685.
—— *danææfolium*, iii. 683.
—— *durvillei*, iii. 683.
—— *hirsutum*, iii. 683.
—— *fraxinifolium*, iii. 683.
—— *inæquale*, iii. 683.
—— *sculpturatum*, iii. 683.
—— serratifolium, iii. 689.
—— *speciosum*, iii. 683.
—— *umbrosum*, iii. 683.
—— *vulgare*, iii. 683.
Chrysophania fastigata, ii. 159.
CHRYSOPHYLLUM, ii. 295.
Chrysophyllum cainito, ii. 295.
CHRYSOPOGON, iii. 530.
Chrysopogon, iii. 527, 531.
—— avenaceus, iii. 530.
—— *avenaceus*, iii. 525.
—— francavillanus, iii. 530.
—— *minarum*, iii. 530.
—— nutans, iii. 531.
—— *nutans*, iii. 530, 531.
—— *stipoides*, iii. 530, 531.
CHRYSOPSIS, ii. 113.
—— foliosa, ii. 114.
—— graminifolia, ii. 114.
—— oliganthes, ii. 114.
—— *scaber*, ii. 210.
—— *schaffneri*, ii. 114.
—— villosa, var. canescens, iv. 52.
—— *villosa*, ii. 114.
Chrysopteris araneosa, iii. 655.
—— *areolata*, iii. 655.
—— *decumana*, iii. 656.
—— *glauca*, iii. 655.
—— *glaucina*, iii. 655.
—— *lanosa*, iii. 655.
Chrysopteris microdictyon, iii. 655.
—— *sporadocarpa*, iii. 655.
—— *trilobata*, iii. 655.
Chrysothamnus, ii. 115.
Chthamalia, ii. 330, 335.
Chthamalia bifidus, ii. 330.
—— *nummularia*, ii. 332.
—— *pedunculata*, ii. 332.
—— schaffneri, ii. 334.
Chuncoa oblonga, i. 403.
—— *obovata*, i. 403.
CHUSQUEA, iii. 586.
Chusquea, iv. 280.
—— *abietifolia*, iv. 273.
—— bilimeki, iii. 587.
—— carinata, iii. 587.
—— galleotiana, iii. 587.
—— *galeottiana*, iv. 297.
—— liebmanni, iii. 587.
—— mülleri, iii. 587.
—— simplicifolia, iii. 587.
—— spinosa, iii. 587.
CHYSIS, iii. 216.
Chysis, iv. 152.
Chysis aurea, iii. 216.
—— *aurea*, iii. 216; iv. 300.
—— —— *limminghii*, iii. 216.
—— bractescens, iii. 216.
—— lævis, iii. 216.
—— limminghii, iii. 216.
—— maculata, iii. 216.
Cibotium guatemalense, iii. 596.
—— horridum, iii. 597.
—— *schiedei*, iii. 597.
Cicca macrostachya, i. 174.
Cicendia quitensis, ii. 346.
CICHORIACEÆ, ii. 259.
Cichoriaceæ, iv. 184.
CICUTA, i. 566.
Cicuta maculata, i. 566.
Cinchona caribæa, ii. 13.
CINCHONEÆ, ii. 7.
Cincinalis affinis, iii. 672.
—— candida, iii. 673.
—— dealbata, iii. 673.
—— nivea, iii. 674.
—— *nivea*, var. *flava*, iii. 674.
Cineraria acutangula, ii. 235.
—— *angustifolia*, ii. 246.
—— *petasitis*, ii. 245.
—— *platanifolia*, ii. 245.
—— *præcox*, ii. 246.
—— *salicifolia*, ii. 246.
—— *vernix*, iv. 121.
Cinna arachnoidea, iii. 541.
—— *macroura*, iii. 549.
—— *mexicana*, iii. 549, 551.

Cinna setifolia, iii. 549.
—— *stricta*, iii. 549.
Cionandra racemosa, i. 486.
Ciponima costaricana, ii. 301.
—— jurgensenii, ii. 301.
—— prionophylla, ii. 302.
—— pycnantha, ii. 302.
—— speciosa, ii. 302.
CIPURA, iii. 328.
Cipura cubensis, iv. 91.
—— *graminea*, iii. 328.
—— *humilis*, iii. 328.
—— *martinicensis*, iii. 326.
—— paludosa, iii. 328; iv. 90.
CIRCÆA, i. 468.
Cirrhæa tristis, iii. 292.
Cirsium cernuum, ii. 252.
—— *conspicuum*, ii. 251.
—— *grahami*, ii. 253.
—— *heterolepis*, ii. 252.
—— *jorullense*, ii. 251.
—— *lanceolatum*, ii. 251.
—— *lappoides*, ii. 251.
—— *maximum*, ii. 252.
—— *mexicanum*, ii. 251.
—— *nivale*, ii. 252.
—— *pazcuarense*, ii. 252.
—— *platycephalum*, ii. 252.
—— *radians*, ii. 252.
—— *subcoriaceum*, ii. 252.
—— *undulatum*, ii. 253.
—— *wrightii*, ii. 253.
CISSAMPELIDEÆ, i. 21.
CISSAMPELOS, i. 21.
Cissampelos acuminata, i. 22.
—— *canescens*, i. 22.
—— grandifolia, i. 21.
—— heterophylla, i. 21; iv. 3.
—— microcarpa, i. 21.
—— pareira, i. 22; iv. 111.
—— *pareira*, i. 21.
—— tomentosa, i. 22; iv. 3.
Cissus, i. 202; iv. 147.
Cissus chontalensis, iv. 23.
—— javalensis, iv. 23.
—— *obovata*, i. 204.
—— *sicyoides*, i. 203.
Cistaceæ, iv. 172.
CISTINEÆ, i. 46; iv. 8.
Cistineæ, iv. 205, 224, 235.
Cistus glomeratus, i. 47.
CITHAREXYLUM, ii. 536.
Citharexylum affine, ii. 536.
—— *affine*, ii. 537.
—— caudatum, ii. 536; iv. 113.
—— ellipticum, ii. 536.
—— *erectum*, ii. 536.
Citharexylum incanum, ii. 536.
—— *lucidum*, ii. 536.
—— lycioides, ii. 537.
—— moçini, ii. 537.
—— reticulatum, ii. 537.
—— scabrum, ii. 537.
—— *scariosum*, ii. 537.
—— sessei, ii. 537.
—— villosum, ii. 537.
Citrosma, iii. 68, 146, 167, 302.
—— *andina*, iii. 69.
—— *pauciflora*, iii. 70.
—— *riparia*, iii. 70.
Citrullus vulgaris, i. 482.
Citrus, iv. 146.
—— *aurantium*, i. 172.
—— *decumana*, i. 172.
—— *limonium*, i. 172.
—— *media*, i. 172.
—— *vulgaris*, i. 172.
CLADIUM, iii. 468.
Cladium mariscus, iii. 468.
—— *occidentale*, iii. 468.
CLADOTHRIX, iii. 15.
Cladothrix lanuginosa, iii. 15.
CLAMBUS, iv. 3.
Clambus araneosus, iv. 3.
CLAPPIA, ii. 227.
Clappia aurantiaca, ii. 227.
—— *aurantiaca*, iv. 60.
Clarionea, ii. 255.
—— *runcinata*, ii. 257.
Clavigera corymbosa, ii. 104.
—— *dentata*, ii. 105.
—— *scabra*, ii. 104.
—— *scoparia*, ii. 106.
—— *spinulosa*, ii. 107.
CLAVIJA, ii. 294.
Clavija biborrana, ii. 294.
CLAYTONIA, i. 80.
Claytonia, iv. 229, 234.
Claytonia perfoliata, i. 80.
CLEIDION, iii. 130.
Cleidion nicaraguense, iii. 130.
Cleistes rosea, iii. 304; iv. 270.
CLEMATIDEÆ, i. 1.
CLEMATIS, i. 1; iv. 1.
Clematis, iv. 163.
Clematis acapulcensis, i. 1.
—— *acapulcensis*, iv. 1.
—— americana, i. 1.
—— *americana*, iv. 1.
—— *caracasana*, i. 1; iv. 1.
—— caripensis, i. 1.
—— *caripensis*, i. 2; iv. 1.
—— *caudata*, i. 2.
—— *cordata*, iv. 1.
Clematis dioica, i. 2; iv. 111.
—— *dioica*, i. 1; iv. 1, 44.
—— drummondii, i. 2.
—— *drummondii*, iv. 1.
—— filifera, i. 2.
—— *filifera*, iv. 1.
—— flammulastrum, i. 2.
—— *flammulastrum*, iv. 1.
—— grahami, i. 2.
—— *grahami*, i. 3; iv. 1.
—— grossa, i. 2.
—— *grossa*, iv. 1.
—— incisa, i. 2.
—— lasiantha, iv. 1.
—— moçiniana, i. 2.
—— *moçiniana*, iv. i.
—— nervata, i. 2; iv. 1.
—— pauciflora, i. 2.
—— *pauciflora*, iv. 1.
—— *pitcheri*, i. 3; iv. 141.
—— pitcheri, iv. 1.
—— polycephala, i. 2.
—— *polycephala*, iv. 1.
—— pubescens, i. 3.
—— *pubescens*, iv. 1.
—— reticulata, i. 3.
—— *reticulata*, i. 2; iv. 1.
—— sericea, i. 3.
—— *sericea*, i. 2; iv. 1.
—— ——, var. ?, i. 3.
—— *simsii*, iv. 1.
—— *viorna*, iv. 1.
CLEOME, i. 41.
Cleome arborea, i. 45.
—— cardinalis, i. 41.
—— cremoloba, iv. 7.
—— *heptaphylla*, i. 42.
—— macrantha, iv. 7.
—— mexicana, i. 41; iv. 7.
—— multicaulis, i. 41.
—— polygama, i. 41; iv. 111.
—— pubescens, i. 41.
—— sonoræ, i. 41.
—— *speciosa*, i. 43.
—— speciosissima, i. 41.
CLEOMEÆ, i. 41.
CLEOMELLA, i. 42.
Cleomella angustifolia, i 42.
—— *coulteri*, i. 43.
—— longipes, i. 42.
—— *medicaginea*, iv. 7.
—— mexicana, i. 42.
CLERODENDRON, ii. 540.
Clerodendron aculeata, ii. 540.
—— *fragrans*, ii. 540.
—— *ligustrinum*, ii. 540.
CLETHRA, ii. 284.

Clethra, iv. 302.
—— *kowalewskii*, ii. 284.
—— lanata, ii. 284.
—— macrophylla, ii. 284.
—— mexicana, ii. 284.
—— *mexicana*, iv. 29, 303.
—— *obovata*, ii. 284.
—— quercifolia, ii. 284.
—— *serrulata*, ii. 284.
—— suaveolens, ii. 284.
—— *tinifolia*, i. 98; ii. 284; iv. 147, 148.
CLEYERA, i. 93.
Cleyera, iv. 229.
Cleyera integrifolia, i. 93.
—— mexicana, i. 93.
CLIBADIUM, ii. 142.
Clibadium acuminatum, ii. 142.
—— asperum, ii. 142.
—— leiocarpum, ii. 143.
CLIDEMIA, i. 430.
Clidemia, iv. 159, 243.
—— *anisotricha*, i. 425.
—— chinantlana, i. 430.
—— *chrysopogon*, i. 425.
—— *cyanocarpa*, i. 433.
—— *decurrens*, i. 433.
—— dentata, i. 430.
—— dependens, i. 430.
—— *dependens*, iv. 242.
—— *deppeana*, i. 431.
—— *elegans*, i. 430.
—— *fenestrata*, i. 431.
—— hirta, i. 430.
—— laxiflora, i. 430.
—— *lugubris*, i. 423.
—— *melanodesma*, i. 423.
—— melanotricha, i. 431.
—— *multiplinervis*, i. 423.
—— neglecta, i. 431.
—— *neglecta*, iv. 242.
—— petiolaris, i. 431.
—— *petiolata*, i. 431.
—— *sagittata*, i. 423.
—— *secunda*, i. 423.
—— serrulata, i. 431.
—— *spicata*, i. 427.
—— *urceolata*, i. 431.
Clidemiastrum mexicanum, i. 423.
CLITORIA, i. 294.
Clitoria glycinoides, i. 294.
—— grandiflora, i. 294.
—— javitensis, i. 295.
—— mariana, i. 295.
—— *mexicana*, i. 295.
—— multiflora, i. 295.
—— polystachya, i. 295.
Clitoria portobellensis, i. 295.
—— schiedeana, i. 295.
—— ternatea, iv. 112.
—— *virginiana*, i. 294.
Clomena peruviana, iii. 540.
Clomenocoma aurantia, ii. 219; iv. 60.
—— *montana*, ii. 219.
—— *pinnata*, ii. 219.
CLUSIA, i. 85.
Clusia, iv. 299.
Clusia acuminata, i. 85.
—— guatemalensis, i. 85.
—— *guatemalensis*, i. 86.
—— minor, i. 85.
—— odorata, i. 86.
—— orizabæ, i. 86.
—— ovigera, i. 86.
—— *pratensis*, i. 85.
—— *retusa*, i. 86.
—— rosea, i. 86.
—— *venosa*, i. 85.
Clynhymenia pallidiflora, iii. 290.
CNESTIDEÆ, i. 224.
CNESTIDIUM, i. 224.
Cnestidium rufescens, i. 224; iv. 25.
CNICUS, ii. 250.
Cnicus, iv. 305.
Cnicus acantholepis, ii. 251.
—— *cernuus*, ii. 252.
—— conspicuus, ii. 251.
—— *conspicuus*, iv. 64.
—— costaricensis, ii. 251.
—— *heterolepis*, ii. 252.
—— jorullensis, ii. 251.
—— *jorullensis*, iv. 149.
—— *lanceolatus*, ii. 251.
—— lappoides, ii. 251.
—— lomatolepis, ii. 251.
—— mexicanus, ii. 251; iv. 113.
—— nivalis, ii. 252.
—— *nivalis*, iv. 150, 151, 389.
—— pazcuarensis, ii. 252.
—— radians, ii. 252.
—— rhaphilepis, ii. 252.
—— subcoriaceus, ii. 252.
—— *subcoriaceus*, iv. 289.
—— undulatus, ii. 253.
—— wrightii, ii. 253.
Cnidium peucedanoides, i. 565.
Cnidoscolus angustidens, iii. 106.
—— *michauxii*, iii. 109.
Coatzonte coxoahite, iii. 258.
—— *lyncea*, iii. 258.
COBÆA, ii. 357.
Cobæa, iv. 255.
—— *campanulata*, ii. 358.
Cobæa gracilis, ii. 357.
—— *lutea*, ii. 357.
—— macrostema, ii. 357.
—— minor, ii. 358.
—— *minor*, iv. 150.
—— scandens, ii. 358.
—— stipularis, ii. 358.
—— *trianæ*, ii. 358.
COCCOCYPSELUM, ii. 33.
Coccocypselum canescens, ii. 33.
—— ciliatum, ii. 33.
—— glabrum, ii. 33.
—— hirsutum, ii. 33.
—— nummularifolium, ii. 33.
—— repens, ii. 34.
—— *spicatum*, ii. 32.
COCCOLOBA, iii. 36.
Coccoloba, iv. 259.
Coccoloba barbadensis, ii. 36.
—— caracasana, iii. 36.
—— cozumelensis, iv. 108.
—— humboldti, iii. 36; iv. 114.
—— leptostachya, iii. 36.
—— manzinellensis, iii. 36.
—— mexicana, iii. 36.
—— pubescens, iii. 36.
—— *punctata*, iii. 36.
—— strobilulifera, iii. 36.
—— uvifera, iii. 37; iv. 108.
COCCULEÆ, i. 21.
COCCULUS, i. 21.
Cocculus diversifolius, i. 21.
—— *domingensis*, i. 22.
—— *oblongifolius*, i. 21.
Cochliopetalum odoratum, iii. 317.
COCHLOSPERMUM, i. 55.
Cochlospermum, iv. 146.
Cochlospermum hibiscoides, i. 55.
—— *serratifolium*, i. 55.
Cocos, iii. 415.
Cocos, iv. 275, 276.
Cocos nucifera, iii. 415.
—— *nucifera*, iv. 274, 275.
Codon, iv. 255.
Codonanthe, ii. 487.
Cœlestina ageratoides, ii. 81.
—— *albida*, ii. 81.
—— *corymbosa*, ii. 81, 83.
—— *latifolia*, ii. 82.
—— *lessingiana*, ii. 81.
—— *microcarpa*, ii. 82.
—— *paleacea*, ii. 83.
—— *petiolata*, ii. 83.
—— *scabriuscula*, ii. 83
—— *tomentosa*, ii. 84.
CŒLIA, iii. 213.
Cœlia bauerana, iii. 213.

Cœlia baueriana, iv. 301.
—— bella, iii. 214.
—— guatemalensis, iii. 214.
—— macrostachya, iii. 214.
—— *macrostachya*, iv. 304.
—— *triptera*, iii. 214.
CŒLIOPSIS, iii. 253.
Cœliopsis hyacinthosma, iii. 253.
Cœtocapnia geminiflora, iii. 337.
Coffea occidentalis, ii. 47.
—— *rosea*, ii. 40.
COHNIA, iii. 273.
Cohnia quekettioides, iii. 273.
Coilanthe moçini, ii. 350.
—— *sessœi*, ii. 351.
COIX, iii. 511.
Coix arundinacea, iii. 511.
—— lacryma, iii. 511.
Colax aromaticus, iii. 253.
—— *modestior*, iii. 253.
COLCHICEÆ, iii. 380.
COLDENIA, ii. 371.
Coldenia canescens, ii. 371.
—— *canescens*, iv. 72.
—— greggii, ii. 371.
—— hispidissima, ii. 371.
—— mexicana, iv. 71.
—— *mexicana*, iv. 72.
—— tomentosa, iv. 71.
Coleophyllum ehrenbergii, iii. 332.
Coleosanthus cavanillesii, ii. 104.
Colicodendron, i. 44.
—— *subbilobum*, i. 44.
Collea, iii. 425.
COLLETIA, i. 201.
Colletia disperma, i. 201.
—— multiflora, i. 201.
—— *multiflora*, i. 188; iv. 22.
COLLETIEÆ, i. 201.
Collinia elatior, iii. 405.
—— *elegans*, iii. 404.
—— *fibrosa*, iii. 407.
—— humilis, iii. 404.
—— liebmannii, iii. 405.
Collinsia corymbosa, ii. 447.
COLLOMIA, ii. 354.
Collomia, iv. 255.
Collomia cavanillesiana, ii. 354.
—— gracilis, ii. 354.
—— longiflora, ii. 354.
—— thurberi, ii. 354.
COLOBANTHUS, i. 72.
Colobanthus, iv. 234, 236, 314.
Colobanthus quitensis, i. 72.
—— *quitensis*, iv. 234, 283.
COLOGANIA, i. 295.
Cologania affinis, i. 295.
Cologania angustifolia, iv. 30.
—— angustifolia, i. 295.
—— humifusa, i. 296.
—— intermedia, i. 296.
—— *intermedia*, iv. 284.
—— lemmoni, iv. 30.
—— longifolia, i. 296; iv. 30.
—— martia, iv. 30.
—— obovata, i. 296.
—— *ovalifolia*, i. 296.
—— procumbens, i. 296.
—— pulchella, i. 296.
COLUBRINA, i. 200.
Colubrina alamani, i. 200.
—— *buxifolia*, i. 199.
—— celtidifolia, i. 200.
—— ehrenbergii, i. 200.
—— glomerata, i. 200; iv. 22.
—— greggii, iv. 22.
—— *infesta*, i. 201.
—— rufa, i. 201.
Columellia, iv. 236.
Columelliaceæ, iv. 188.
COLUMNEA, ii. 484.
Columnea, iv. 213.
Columnea acuminata, ii. 485.
—— *bilabiata*, ii. 485.
—— billbergiana, ii. 485.
—— consanguinea, ii. 485.
—— crassifolia, ii. 485.
—— *erythrocalyx*, ii. 486.
—— erythrophæa, ii. 485.
—— flaccida, ii. 485.
—— flava, ii. 485.
—— glabra, ii. 485.
—— heterophylla, ii. 485.
—— *hirsuta*, ii. 485.
—— hirta, ii. 485.
—— lepidocaula, ii. 485.
—— linearis, ii. 485.
—— magnifica, ii. 486.
—— microcalyx, ii. 486.
—— microphylla, ii. 486.
—— nervosa, ii. 486.
—— nicaraguensis, ii. 486.
—— ochroleuca, ii. 486.
—— œrstediana, ii. 486.
—— oxyphylla, ii. 486.
—— pendula, ii. 486.
—— prætexta, ii. 486.
—— purpurata, ii. 486.
—— querceti, ii. 486.
—— sanguinolenta, ii. 487.
—— schiedeana, ii. 487.
—— *schiedeana*, iv. 262.
—— serrata, ii. 487.
—— tenuis, ii. 487.
Columnea tomentosa, ii. 487.
—— umbellata, ii. 487.
—— warscewicziana, ii. 487.
—— wendlandiana, ii. 487.
Comaclinium aurantiacum, ii. 219.
COMANDRA, iii. 87.
Comandra angustifolia, iii. 87.
—— *pallida*, *β. angustifolia*, iii. 87.
—— umbellata, iii. 87.
Comarostaphylis angustifolia, ii. 278.
—— *arbutoides*, ii. 278.
—— *arguta*, ii. 278.
—— *attenuata*, ii. 278.
—— *glaucescens*, ii. 278.
—— *hartwegiana*, ii. 278.
—— *longifolia*, ii. 278.
—— *mucronata*, ii. 279.
—— *mucronifera*, ii. 279.
—— *oaxacana*, ii. 279.
—— *polifolia*, ii. 279.
—— *rubescens*, ii. 279; iv. 156.
Comarostylis rubescens, iv. 159.
COMBRETACEÆ, i. 402; iv. 36, 100.
Combretaceæ, iv. 180, 204, 215, 217, 230, 233.
COMBRETEÆ, i. 402.
COMBRETUM, i. 403.
Combretum, iv. 146.
Combretum adenophyllum, i. 403.
—— alternifolium, i. 403.
—— argenteum, i. 403.
—— *argenteum*, i. 404.
—— benthamianum, i. 403.
—— erianthum, i. 404.
—— farinosum, i. 404.
—— jacquini, i. 404.
—— *laxum*, i. 404.
—— mexicanum, i. 404.
—— micropetalum, i. 404.
—— reticulatum, i. 404.
—— *secundum*, i. 404.
COMMELINA, iii. 386.
Commelina, iii. 388; iv. 148.
Commelina acuminata, iii. 387.
—— *angustifolia*, iii. 387.
—— *auriculata*, iii. 389.
—— bourgeaui, iii. 387.
—— cardiosepala, iii. 388.
—— *caripensis*, iii. 389.
—— *carnea*, iii. 389.
—— clandestina, iii. 388.
—— cœlestis, iii. 387.
—— *decumbens*, iii. 388.
—— *deficiens*, iii. 389.
—— dianthifolia, iii. 387.
—— *dianthifolia*, iii. 388.

Commelina dianthifolia, var. *polyspatha*, iii. 387.
—— dubia, iii. 387
—— *dubia*, iii. 384.
—— *ehrenbergiana*, iii. 389.
—— *elegans*, iii. 389.
—— elliptica, iii. 387.
—— *elliptica*, iv. 295.
—— erecta, iii. 387 ; iv. 109.
—— *floribunda*, iii. 392.
—— graminifolia, iii. 387.
—— *hexandra*, iii. 389.
—— intermedia, iii. 387.
—— *karwinskii*, iii. 387.
—— leiandra, iii. 388.
—— *leiocarpa*, iii. 386.
—— *linearis*, iii. 387.
—— *mexicana*, iii. 392.
—— monticola, iii. 388.
—— *multiflora*, iii. 395.
—— nudiflora, iv. 114.
—— *orchioides*, iii. 387.
—— *pallida*, iii. 386.
—— pallida, iii. 388.
—— parviflora, iii. 388.
—— *parviflora*, iii. 389.
—— *persicariæfolia*, iii. 386.
—— quitensis, iii. 388.
—— rosea, iii. 388.
—— *rubens*, iii. 388.
—— scabra, iii. 389.
—— *scapigera*, iii. 387.
—— stricta, iii. 388.
—— *sulcata*, iii. 389.
—— tuberosa, iii. 389.
—— *tuberosa*, iii. 387.
—— *undulata*, iii. 389.
—— *variabilis*, iii. 387.
—— vestita, iii. 388.
—— virginica, iii. 389; iv. 114.
COMMELINACEÆ, iii. 386; iv. 91, 109.
Commelinaceæ, iv. 197, 203, 215, 217, 226.
COMOCLADIA, i. 220.
Comocladia acuminata, i. 220.
—— mollissima, i. 220.
COMPARETTIA, ii. 270.
Comparettia coccinea, iii. 270.
—— falcata, iii. 270.
—— *rosea*, iii. 270.
—— *saccata*, iii. 270.
COMPOSITÆ, ii. 69 ; iv. 49, 102.
Compositæ, iv. 166, 183, 202, 215, 217, 225, 229, 231, 233, 234, 249.
Conanthera albiflora, iii. 376.
Conanthera echeandia, iii. 376.
CONDALIA, i. 196.
Condalia mexicana, i. 196.
—— *obovata*, iv. 141.
—— spathulata, i. 196; iv. 22.
CONDAMINEA, ii. 14.
Condaminea, iv. 163.
Condaminea corymbosa, ii. 14.
CONDAMINEÆ, ii. 14.
CONIFERÆ, iii. 183; iv. 88.
Coniferæ, iv. 194, 203, 215, 217, 226, 229, 264.
CONNARACEÆ, i. 223.
Connaraceæ, iv. 178, 204.
CONNAREÆ, i. 224.
CONNARUS, i. 224.
Connarus hæmorrhœus, i. 224.
—— panamensis, i. 224.
—— turczaninowii, i. 224.
CONOBEA, ii. 451.
Conobea alata, ii. 448.
—— intermedia, ii. 451.
—— pusilla, ii. 451.
—— scoparioides, ii. 451.
CONOCARPUS, i. 403.
Conocarpus, iv. 230.
Conocarpus erecta, i. 403; iv. 36, 100, 112.
—— *erecta*, iv. 233.
CONOCEPHALEÆ, iii. 150.
Conoclinium album, ii. 92.
—— *betonicum*, ii. 93.
—— *dissectum*, ii. 94.
—— *ianthinum*, ii. 96.
—— oligolepis, ii. 98.
CONOPHOLIS, ii. 468; iv. 77.
Conopholis alpina, iv. 78.
—— americana, ii. 468.
—— *americana*, iv. 78.
—— mexicana, iv. 78.
—— *mexicana*, iv. 77.
—— sylvatica, iv. 78.
—— *sylvatica*, iv. 262.
Conostachys, sp., iii. 323.
CONOSTEGIA, i. 423.
Conostegia, iv. 163.
Conostegia arborea, i. 423.
—— bracteata, i. 423.
—— lasiopoda, i. 423.
—— macrantha, i. 423.
—— *macrophylla*, i. 424.
—— œrstediana, i. 423.
—— *purpurea*, i. 424.
—— speciosa, i. 424.
—— sphærica, i. 424.
—— subcrustulata, i. 424.
—— subhirsuta, i. 424.
Conostegia superba, i. 424.
—— xalapensis, i. 424.
Conradia, ii. 481.
—— *cuneifolia*, ii. 481.
—— *pedunculosa*, ii. 481.
Convallaria, iv. 149.
—— *majalis*, iii. 369.
CONVALLARIÆ, iii. 369.
CONVOLVULACEÆ, ii. 382; iv. 73, 105.
Convolvulaceæ, iv. 187, 202, 215, 217, 225, 231, 234, 256.
CONVOLVULUS, ii. 397.
Convolvulus, iv. 147.
—— *ampelopsifolius*, ii. 393.
—— *apocynoides*, ii. 396.
—— *arborescens*, ii. 383.
—— *arboreus*, iv. 146.
—— *arvensis*, ii. 397.
—— attenuatus, ii. 397.
—— *bonariensis*, ii. 397.
—— *cæruleus*, ii. 396.
—— *candicans*, ii. 391.
—— *capillaceus*, ii. 384.
—— cladotrichus, ii. 397.
—— deglabratus, ii. 398.
—— *densiflorus*, ii. 395.
—— *dissectus*, ii. 394, 397.
—— *equitans*, ii. 397.
—— *esculentus*, ii. 384.
—— *glaucifolius*, ii. 397.
—— *hederaceus*, ii. 387, 390.
—— incanus, ii. 397.
—— *jalapa*, ii. 388.
—— lapathifolius, ii. 397.
—— luteus, ii. 397.
—— *macranthus*, ii. 390.
—— *martinicensis*, ii. 390.
—— micranthus, ii. 397.
—— minutiflorus, ii. 398.
—— mollissimus, ii. 398.
—— *munitiflorus*, ii. 398.
—— *neei*, ii. 391.
—— nodiflorus, ii. 398.
—— palustris, ii. 398.
—— *panduratus*, ii. 391.
—— *pentanthos*, ii. 397.
—— *pes-capræ*, ii. 392.
—— *polyanthus*, ii. 397.
—— *polycarpus*, ii. 397.
—— *pudibundus*, ii. 385.
—— *purga*, ii. 393.
—— *purpureus*, ii. 393.
—— *serotinus*, ii. 393.
—— *serpyllifolius*, ii. 393.
—— *sphærostigma*, ii. 396.
—— *stans*, ii. 394.

Convolvulus stoloniferus, ii. 385.
—— *suaveolens*, ii. 394.
—— *suffultus*, ii. 394.
—— *sulphureus*, ii. 386.
—— *superbus*, ii. 394.
—— tenuifolius, ii. 398.
—— *trifidus*, ii. 395.
—— *variabilis*, ii. 395.
CONYZA, ii. 125.
Conyza, ii. 129; iv. 150.
Conyza ?, ii. 126, 127.
Conyza absinthifolia, ii. 127.
—— adnata, ii. 125.
—— apurensis, ii. 125.
—— asperifolia, ii. 126.
—— chilensis, ii. 126.
—— coronopifolia, ii. 126.
—— cortesii, ii. 126.
—— *cortesii*, ii. 133.
—— fastigiata, ii. 126.
—— gnaphalioides, ii. 126.
—— hispida, ii. 126.
—— lyrata, ii. 126.
—— microcephala, ii. 126.
—— obtusa, ii. 127.
—— *odorata*, ii. 133.
—— panamensis, ii. 127.
—— *pulchella*, ii. 127.
—— *purpurascens*, ii. 133.
—— *rivularis*, ii. 129.
—— sophiæfolia, ii. 127.
—— *sophiæfolia*, iv. 288.
—— subdecurrens, ii. 127.
—— thesiifolia, ii. 127.
—— *tricuneata*, ii. 128.
COOPERIA, iii. 332.
Cooperia chlorosolen, iii. 332.
—— drummondii, iii. 332.
—— *mexicana*, iii. 332.
COPAIFERA, i. 341.
Copaifera, iv. 230.
Copaifera officinalis, i. 342.
COPERNICIA, iii. 411.
Copernicia nana, iii. 411.
Corallophyllum cæruleum, ii. 286.
CORALLORHIZA, iii. 212.
Corallorhiza bulbosa, ii. 213; iv. 304.
—— ehrenbergii, iii. 212.
—— grandiflora, iii. 213.
—— mexicana, iii. 213.
—— *mexicana*, iv. 294, 301, 305.
—— punctata, iv. 89.
CORCHORUS, i. 139.
Corchorus argutus, i. 139.
—— pilolobus, i. 140; iv. 15.
—— pilosus, i. 140.
—— siliquosus, i. 140.
CORDIA ii. 366.
Cordia, iv. 213.
Cordia alba, ii. 366.
—— ambigua, ii. 366.
—— boissieri, ii. 366.
—— brevispicata, ii. 366.
—— cana, ii. 366.
—— collococca, ii. 366.
—— crenulata, ii. 367.
—— crispiflora, ii. 367.
—— dasycephala, ii. 367.
—— *dentata*, ii. 366.
—— diversifolia, ii. 367.
—— dodecandra, ii. 367; iv. 105.
—— elæagnoides, ii. 367.
—— ferruginea, ii. 367.
—— foliosa, ii. 367.
—— gerascanthoides, ii. 367.
—— gerascanthus, ii. 367; iv. 113.
—— *gerascanthus*, ii. 369; iv. 143.
—— globosa, ii. 367; iv. 105.
—— greggii, ii. 368.
—— hartwigiana, ii. 368.
—— hermanniæfolia, ii. 368.
—— hispida, ii. 368.
—— interrupta, ii. 368.
—— laxiflora, ii. 368.
—— linearis, ii. 368.
—— macrocephala, ii. 368.
—— microcephala, ii. 368.
—— oaxacana, ii. 368.
—— *obliqua*, ii. 368.
—— parvifolia, ii. 368.
—— *parvifolia*, ii. 369.
—— peruviana, var. mexicana, ii. 368.
—— podocephala, ii. 369; iv. 71.
—— rotata, ii. 369.
—— rotundifolia, ii. 369.
—— serratifolia, ii. 369.
—— speciosa, iv. 113.
—— tenuifolia, ii. 369.
—— tinifolia, ii. 369.
—— ulmifolia, ii. 369.
CORDYLANTHUS, ii. 464.
Cordylanthus laxiflorus, ii. 464.
—— wrightii, ii. 464.
Cordyline, iv. 274.
—— *longifolia*, iii. 372.
—— *parviflora*, iii. 372.
COREOPSIS, ii. 195.
Coreopsis, iv. 231.
—— *alata*, ii. 186.
—— *amplexicaulis*, ii. 183.
—— anthemoides, ii. 195; iv. 58.
—— *artemisiæfolia*, ii. 200.
—— *cardaminæfolia*, iv. 141.
Coreopsis diversifolia, ii. 202.
—— drummondii, ii. 195.
—— *ferulæfolia*, ii. 202.
—— *fœtida*, ii. 184; iv. 57.
—— *formosa*, ii. 199.
—— galeottii, ii. 195.
—— *georgina*, ii. 197.
—— *heterophylla*, ii. 168.
—— liebmannii, ii. 196.
—— linearifolia, ii. 196.
—— mexicana, ii. 196.
—— mutica, ii. 196.
—— œrstediana, ii. 196.
—— *ovata*, ii. 185.
—— rudis, ii. 196.
—— schaffneri, iv. 58.
—— *tetragona*, ii. 204.
—— trifoliata, ii. 196.
Coriandrum sativum, i. 571.
CORIARIA, i. 223.
Coriaria atropurpurea, i. 223.
—— thymifolia, i. 223.
—— *thymifolia*, iv. 234.
CORIARIEÆ, i. 223.
Coriarieæ, iv. 178, 205, 217, 234.
CORISPERMUM, iii. 26.
Corispermum hyssopifolium, iii. 26.
CORNACEÆ, i. 575.
Cornaceæ, iv. 182, 204, 225.
Cornicularia bicolor, iv. 149.
Cornidia radiata, i. 383.
Cornucopiæ, iii. 531.
CORNUS, i. 575.
Cornus, iv. 147, 149.
Cornus disciflora, i. 575.
—— excelsa, i. 575.
—— florida, i. 576.
—— *grandis*, i. 575.
—— stricta, i. 576.
—— tolucensis, i. 576.
—— *tuluccensis*, iv. 147.
CORNUTIA, ii. 539.
Cornutia grandifolia, ii. 539.
—— longifolia, ii. 539.
—— pyramidata, ii. 539.
CORONARIEÆ, iii. 362.
CORRIGIOLA, iii. 11.
Corrigiola andina, iii. 11; iv. 82.
—— littoralis, iv. 82.
CORYANTHES, iii. 256.
Coryanthes, iv. 152.
—— *maculata*, iii. 256.
—— picturata, iii. 256.
—— speciosa, var., iii. 256.
—— *speciosa*, iii. 256.
CORYDALIS, i. 28.
Corydalis aurea, i. 28.

CORYLEÆ, iii. 166.
Corylus, iv. 260.
CORYMBIS, iii. 296.
Corymbis flava, iii. 297.
CORYNÆA, iii. 88.
Corynæa crassa, iii. 88.
CORYNOSTYLIS, i. 48.
Corynostylis berterii, i. 48.
—— hybanthus, i. 49.
Corypha, iv. 147, 276.
—— *dulcis*, iii. 411.
—— *nana*, iii. 411.
—— *umbraculifera*, iv. 272.
Cosmanthus mexicanus, ii. 359.
Cosmea lutea, ii. 202.
COSMIBUENA, ii. 12.
Cosmibuena macrocarpa, ii. 12.
—— skinneri, ii. 12.
Cosmidium gracile, ii. 198.
—— *simplicifolium*, ii. 198.
Cosmophylla, ii. 192.
COSMOS, ii. 198.
Cosmos, iv. 58.
—— *atrosanguineus*, ii. 199.
—— bipinnatus, ii. 198.
—— *bipinnatus*, ii. 200.
—— caudatus, ii. 199.
—— chrysanthemifolius, ii. 199.
—— crithmifolius, ii. 199.
—— diversifolius, ii. 199.
—— *diversifolius*, iv. 288.
—— exaristatus, ii. 199.
—— linearifolius, ii. 200.
—— parviflorus, ii. 199.
—— pilosus, ii. 200.
—— *pulcherrimus*, ii. 199.
—— purpureus, ii. 200.
—— *reptans*, ii. 199.
—— scabiosoides, ii. 200.
—— *scabiosoides*, iv. 288.
—— sulphureus, ii. 200.
—— tenellus, ii. 200.
—— tenuifolius, ii. 200.
—— uhdeanus, ii. 200.
COSTUS, iii. 308.
Costus hirsutus, iii. 308.
—— pictus, iii. 308.
—— pulverulentus, iii. 308.
—— spicatus, iii. 308.
COTONEASTER, i. 380.
Cotoneaster denticulata, i. 380; iv. 35.
—— *denticulata*, iv. 303.
—— latifolia, i. 380.
—— nervosa, iv. 35.
Cottea pappophoroides, iii. 568.
COTULA, ii. 230.
Cotula pygmæa, ii. 230.
—— *pygmæa*, iv. 288.
COTYLEDON, i. 387.
Cotyledon, i. 388; iv. 120, 213, 241, 299.
Cotyledon acutifolia, i. 387.
—— adunca, i. 387.
—— agavoides, i. 387.
—— albiflora, i. 388.
—— atropurpurea, i. 388.
—— batesii, i. 388.
—— bifida, i. 388.
—— cæspitosa, i. 389.
—— canaliculata, i. 389.
—— carnicolor, i. 389.
—— coccinea, i. 388.
—— corderoyi, i. 389.
—— cymosa, i. 389.
—— desmetiana, i. 389.
—— farinulenta, i. 389.
—— fulgens, i. 389.
—— galleottiana, i. 389.
—— gibbiflora, i. 390.
—— glauca, i. 390.
—— grayii, i. 390.
—— jurgensenii, i. 390.
—— linguæfolia, i. 390.
—— *linguiformis*, i. 389.
—— lurida, i. 390.
—— metallica, i. 390.
—— mexicana, i. 390.
—— mucronata, i. 391.
—— nevadensis, i. 391.
—— nodulosa, i. 391.
—— nuda, i. 391.
—— pachyphytum, i. 391.
—— parviflora, i. 391.
—— pubescens, i. 391.
—— pumila, i. 391.
—— *reflexa*, i. 389.
—— retusa, i. 392.
—— roseata, i. 392.
—— schaffneri, iv. 35.
—— scheerii, i. 392.
—— secunda, i. 392.
—— stolonifera, i. 392.
—— strictiflora, i. 392.
—— subulifolia, i. 392.
COUEPIA, i. 367.
Couepia kunthiana, i. 367.
Coulteria gracilis, i. 324.
Courantia echeverioides, i. 392.
COUROUPITA, i. 414.
Couroupita nicaraguensis, i. 414.
—— *nicaraguensis*, iv. 242.
—— odoratissima, i. 414.
COURSETIA, i. 261.
Coursetia arborea, i. 261.
—— virgata, i. 261.
COUSSAREA, ii. 47.
Coussarea pentamera, ii. 47.
COUSSAREEÆ, ii. 46.
COUTAREA, ii. 12.
Coutarea flavescens, ii. 12.
—— latiflora, ii. 12.
—— mexicana, ii. 13.
—— *mexicana*, ii. 15.
—— octomera, iv. 101.
—— speciosa, ii. 13.
COUTOUBEA, ii. 348.
Coutoubea densiflora, ii. 348.
—— *minor*, ii. 348.
—— spicata, ii. 348.
COWANIA, i. 374.
Cowania, iv. 120, 240.
—— *ericifolia*, iv. 142.
—— mexicana, i. 374.
—— plicata, i. 374.
—— *purpurea*, i. 374.
CRACCA, i. 262.
Cracca caribæa, i. 262; iv. 99.
—— edwardsii, i. 262.
—— glabrescens, i. 262.
—— ochroleuca, i. 262.
CRANICHIS, iii. 297.
Cranichis apiculata, iii. 297.
—— ciliata, iii. 297.
—— glandulosa, iii. 297.
—— *glandulosa*, iv. 302.
—— muscosa, iii. 297.
—— reticulata, iii. 297.
—— schaffneri, iii. 297.
—— *schaffneri*, iii. 298.
—— speciosa, iii. 297.
—— *speciosa*, iii. 298.
—— subumbellata, iii. 297.
—— sylvatica, iii. 297.
—— tubularis, iii. 298.
—— tubulosa, iii. 298.
CRANTZIA, i. 568.
Crantzia, iv. 234.
Crantzia lineata, i. 569.
—— *lineata*, iv. 234.
—— *schaffneri*, i. 569.
Craspedarea piloselloides, iii. 666.
Crassula lycopodioides, i. 394.
CRASSULACEÆ, i. 387; iv. 35, 100.
Crassulaceæ, iv. 179, 203, 217, 225, 241.
CRATÆGUS, i. 379.
Cratægus, iv. 148, 299.
Cratægus crus-galli, i. 379.
—— mexicana, i. 379.

Cratægus mexicana, iv. 144.
—— ——, var. i. 380.
—— pubescens, i. 380.
—— *pubescens*, iv. 147, 303.
—— stipulosa, i. 380.
—— subserrata, i. 380.
CRATÆVA, i. 45.
Cratæva acuminata, i. 45.
—— gynandra, i. 45.
—— tapia, i. 45.
—— *tapia*, iv. 143.
Cremanium aschenbornianum, i. 422.
—— *berghesianum*, i. 425.
—— *compressum*, i. 425.
—— *oligotrichum*, i. 427.
Crematomia andrieuxii, ii. 369.
—— *formosa*, ii. 369.
—— *guatemalensis*, ii. 370.
—— *huanita*, ii. 370.
—— *spathulata*, ii. 270.
Cremophyllum spathulatum, iii. 133.
Crepidaria myrtifolia, iii. 89.
CRESCENTIA, ii. 498.
Crescentia aculeata, ii. 498.
—— *acuminata*, ii. 498.
—— *alata*, ii. 498; iv. 143.
—— cucurbitina, ii. 498.
—— *cucurbitina*, iv. 162, 165.
—— cujete, ii. 498.
—— *cuneifolia*, ii. 498.
—— *edulis*, ii. 498.
—— *latifolia*, ii. 498.
—— *lethifera*, ii. 498.
—— macrophylla, ii. 499.
—— *musæcarpa*, ii. 498.
—— *obovata*, ii. 498.
—— *ovata*, ii. 498.
—— *toxicaria*, ii. 498.
—— *trifolia*, ii. 498.
CRESSA, ii. 401.
Cressa cretica, ii. 401.
CRINUM, iii. 334.
Crinum americanum, iii. 334.
—— cruentum, iii. 334.
—— erubescens, iii. 334.
—— kunthianum, iii. 334.
—— *loddigesianum*, iii. 334.
Critonia daleoides, ii. 94.
—— *hebebotrya*, ii. 95.
Croomia pauciflora, iii. 362.
Crossandra fascicularis, ii. 510.
—— *hænkeana*, ii. 513.
CROTALARIA, i. 225.
Crotalaria, iv. 213.
—— *acapulcensis*, i. 227.
Crotalaria anagyroides, i. 225.
—— angulata, i. 225.
—— *bracteata*, i. 228.
—— bupleurifolia, i. 225.
—— cajanifolia, i. 225.
—— carmioli, i. 226.
—— dichotoma, i. 226.
—— *dichotoma*, i. 228.
—— dombeyana, i. 226.
—— elliptica, i. 226.
—— eriocarpa, i. 226.
—— eriocaula, i. 226.
—— *galeottii*, i. 228.
—— *genistella*, i. 227.
—— *glabella*, i. 225.
—— guatemalensis, i. 226.
—— *hirsutissima*, i. 225.
—— *hookeriana*, i. 227.
—— incana, i. 226.
—— leptoclona, i. 226.
—— longirostrata, i. 226.
—— *lupulina*, i. 227.
—— macrophylla, i. 226.
—— maypurensis, i. 227.
—— mollicula, i. 227.
—— multiflora, i. 226.
—— nitens, i. 227.
—— ovalis, i. 227; iv. 284.
—— parviflora, i. 227, 228.
—— *parviflora*, i. 225.
—— pilosa, i. 227.
—— *platycarpa*, i. 227.
—— *procumbens*, i. 227.
—— pterocaulon, i. 227.
—— pumila, i. 227; iv. 111.
—— *pumila*, i. 226.
—— purshii, i. 228.
—— retusa, iv. 111.
—— rotundifolia, i. 228.
—— sagittalis, i. 228.
—— *sagittalis*, i. 227.
—— schiedeana, i. 228.
—— setifera, i. 228.
—— stipularia, i. 228.
—— tepicana, i. 228.
—— *triantha*, i. 227.
—— undulata, i. 228.
CROTON, iii. 109.
Croton, iv. 146, 213, 260.
Croton adenodontus, iii. 111.
—— adspersus, iii. 109.
—— angustifolius, iii. 112.
—— *argenteus*, iii. 118.
—— *astroites*, iv. 108.
—— axillaris, iii. 109.
—— berlandieri, iii. 109.
—— *berlandieri*, iii. 113.
Croton billbergianus, iii. 109.
—— capitatus, iii. 110.
—— *castaneæfolius*, iii. 119, 120.
—— *chamædrifolius*, iii. 123.
—— chamædrifolius, iii. 110.
—— ciliato-glandulosus, iii. 110.
—— cladotrichus, iii. 110.
—— *conspurcatus*, iii. 118.
—— cortesianus, iii. 110.
—— corymbulosus, iv. 86.
—— *decalobus*, iii. 118.
—— dioicus, iii. 110, 112.
—— divaricatus, iii. 111.
—— draco, iii. 110.
—— *draco*, δ. *genuinus*, iii. 110.
—— ehrenbergii, iii. 111.
—— *elæagnifolius*, iii. 110.
—— ellipticus, iii. 111.
—— essequiboensis, iii. 116.
—— fragilis, iii. 111.
—— *fragilis*, iii. 114.
—— francoanus, iii. 111.
—— fruticulosus, iii. 111.
—— fuscescens, iii. 111.
—— gardneri, iii. 111.
—— genuinus, iii. 110, 111, 112, 113, 115, 116.
—— glabellus, iii. 111.
—— *glabellus*, iv. 114.
—— glabrescens, iii. 114.
—— glandulosus, iii. 111, 114.
—— *glandulosus*, iii. 112.
—— gossypiifolius, iii. 112.
—— gracilis, iii. 112.
—— grewiæfolius, iii. 112.
—— heterochrous, iii. 113.
—— heterophyllus, iii. 112.
—— hibiscifolius, iii. 112.
—— *hircinus*, iii. 115.
—— hirtus, iii. 111.
—— *hispidus*, iii. 116.
—— hoffmanni, iii. 113.
—— humilis, iii. 113.
—— hypoleucus, iii. 113.
—— incanus, iii. 113.
—— *incanus*, iv. 293.
—— intermedius, iii. 112.
—— lanatus, iii. 115.
—— *leiocarpus*, iii. 114.
—— leptostachyus, iii. 113.
—— leucophyllus, iii. 113.
—— liebmanni, iii. 114.
—— lindheimeri, iii. 110, 112.
—— lindheimerianus, iii. 114.
—— *lindheimerianus*, iv. 86.
—— lobatus, iii. 114.
—— *lobatus*, iv. 231.

Croton longiradiatus, iii. 113.
—— macrodontus, iii. 114.
—— malacophyllus, iii. 113.
—— maritimus, iii. 114; iv. 114.
—— meissneri, iii. 114.
—— mexicanus, iii. 114.
—— miradorensis, iii. 115.
—— morifolius, iii. 115.
—— ——, γ. sphærocarpus, iv. 86.
—— *muricatus*, iii. 117.
—— neomexicanus, iii. 115.
—— niveus, iii. 115.
—— obtusifolius, iii. 115.
—— œrstedianus, iii. 115.
—— pallescens, iii. 111.
—— palmeri, iv. 86.
—— palustris, iii. 120.
—— panamensis, iii. 115.
—— *penicillatus*, iii. 110.
—— *phlomoides*, iv. 108.
—— populifolius, iii. 115.
—— pottsii, iii. 116.
—— pringlei, iv. 86.
—— pulcher, iii. 116.
—— pungens, iii. 116.
—— reflexifolius, iii. 116.
—— repens, iii. 116.
—— rhomboidalis, iii. 116.
—— riviniæfolius, iii. 116.
—— schiedeanus, iii. 116.
—— scordioides, iii. 112.
—— seemanni, iii. 114.
—— septentrionalis, iii. 112.
—— sericeus, iii. 111.
—— *shepherdiæfolius*, iii. 113.
—— soliman, iii. 116.
—— sonoræ, iii. 117.
—— sphærocarpus, iii. 115.
—— stipulaceus, iii. 117.
—— stipularis, iii. 112.
—— stylosus, iii. 117.
—— *subcapitatus*, iii. 113.
—— subcompressus, iii. 117.
—— suberosus, iii. 117.
—— subfragilis, iii. 117.
—— subincanus, iii. 112.
—— subintegrifolius, iii. 114.
—— syringæfolius, iii. 115.
—— tenellus, iii. 112.
—— texensis, iii. 117.
—— tiliæfolius, iii. 116.
—— tomentosus, iii. 110.
—— torreyanus, iv. 86.
—— *trichocarpus*, iii. 110.
—— viridis, iii. 113.
—— virletianus, iii. 117.
—— xalapensis, iii. 117.
CRUCIFERÆ, i. 28; iv. 4, 97.
Cruciferæ, iv. 172, 202, 214, 216, 224, 235.
CRUDYA, i. 341.
Crudya acuminata, i. 341.
CRUCKSHANKSIEÆ, ii. 41.
CRUSEA, ii. 57.
Crusea, iv. 48, 249.
—— *allococca*, iv. 48.
—— brachyphylla, ii. 57.
—— calocephala, ii. 57.
—— coccinea, ii. 57.
—— *coccinea*, iv. 48.
—— *glabra*, ii. 45.
—— hispidula, ii. 57.
—— longibracteata, ii. 57.
—— lucida, ii. 57.
—— parviflora, ii. 57.
—— rubra, ii. 57.
—— subalata, ii. 57.
—— *subalata*, iv. 48.
—— wrightii, ii. 57.
Crybe rosea, iii. 304.
Cryosophila, iii. 411.
Cryphiacanthus angustifolius, ii. 508.
—— *barbadensis*, ii. 507.
—— *dipteracanthus*, ii. 504.
—— *lacteus*, ii. 505.
—— *macrosiphon*, ii. 505.
—— *ovalifolius*, ii. 506.
—— *tubiflorus*, ii. 507.
—— *viscosus*, ii. 507.
Crypsinna macroura, iii. 549.
—— *setifolia*, iii. 549.
—— *stricta*, iii. 549.
Crypsis, iii. 531.
—— *macroura*, iii. 549.
—— *setifolia*, iii. 549.
—— *stricta*, iii. 549.
Cryptangium, iii. 468.
CRYPTARRHENA, iii. 290.
Cryptarrhena lunata, iii. 290.
—— lunata, iv. 89.
—— pallidiflora, iii. 290.
Cryptocalyx nepetæfolia, ii. 529.
CRYPTOCARPUS, iii. 8.
Cryptocarpus globosus, iii. 8.
—— *rhomboideus*, iii. 8.
Cryptogamæ, iv. 201, 208, 209, 218, 219.
CRYPTOGAMIA, iii. 589.
Cryptoloma cordifolium, ii. 478.
—— *pictum*, ii. 479.
—— *pilosum*, ii. 479.
—— *strictum*, ii. 479.
Cryptopodium punctatum, iv. 269.
Cryptosaccus, iii. 289.
Cryptosanus, iii. 289.
CTENIUM, iii. 558.
Ctenium, iv. 232, 280.
Ctenium planifolium, iii. 558.
Ctenopteris delicatula, iii. 657.
CUCUMERINEÆ, i. 482.
CUCUMIS, i. 483.
Cucumis anguria, i. 483.
—— campechianus, i. 483.
—— *campechianus*, iv. 39.
—— *fœtidissima*, i. 483.
—— melo, iv. 39.
—— *melo*, i. 482.
—— *perennis*, i. 483.
—— *sativa*, i. 482.
CUCURBITA, i. 483.
Cucurbita, i. 493.
Cucurbita digitata, i. 483.
—— galeottii, iv. 39.
—— *maxima*, i. 482.
—— perennis, i. 483.
—— radicans, i. 483.
CUCURBITACEÆ, i. 482; iv. 39, 100.
Cucurbitaceæ, iv. 181, 202, 215 217, 225, 231, 233, 245.
CUCURBITACEÆ DUBIÆ, i. 493.
Cuervea latifolia, i. 193.
Cuitlauzina pendula, iii. 274.
CUNILA, ii. 546.
Cunila leucantha, ii. 546.
—— lythrifolia, ii. 546.
—— polyantha, ii. 546.
—— *polyantha*, iv. 292.
—— secunda, iv. 80.
—— stachyoides, ii. 546.
CUNONIEÆ, i. 385.
CUPANIA, i. 212.
Cupania akesia, i. 212.
—— alba, i. 212.
—— americana, i. 212.
—— *cinerea*, i. 212.
—— dentata, i. 212.
—— excelsa, i. 212.
—— fulvida, i. 212.
—— lævigata, i. 213.
—— *mexicana*, i. 213.
—— seemanni, i. 213.
—— *sylvatica*, i. 213.
—— *tomentosa*, i. 212.
CUPHEA, i. 436; iv. 36.
Cuphea, iv. 147, 213, 233, 243.
Cuphea æquipetala, i. 436.
—— *æquipetala*, iv. 285.
—— angustifolia, i. 437.
—— anisophylla, i. 437.
—— *anisophylla*, iv. 36.

Cuphea antisyphilitica, i. 437.
—— apanaxaloa, i. 437.
—— appendiculata, i. 437.
—— *appendiculata*, i. 441.
—— aristata, i. 437.
—— *arvensis*, i. 442.
—— *atrosanguinea*, i. 436.
—— baillonis, iv. 36.
—— balsamona, i. 438.
—— *balsamona*, iv. 233.
—— *barbigera*, i. 442.
—— bracteata, i. 438.
—— bustamanta, i. 438.
—— calaminthæfolia, i. 439.
—— calcarata, i. 439.
—— *calophylla*, iv. 36.
—— *cinnabarina*, i. 445.
—— *coccinea*, i. 439.
—— corniculata, i. 439.
—— costaricensis, i. 440.
—— cyanea, i. 439.
—— *cyanea*, iv. 285.
—— debilis, i. 439.
—— decandra, i. 439.
—— dodecandra, i. 440.
—— *dodecandra*, iv. 36.
—— *donkelarii*, i. 444.
—— elliptica, iv. 36.
—— ——, *β. oligostemon*, iv. 36.
—— *eminens*, i. 443.
—— epilobiifolia, i. 440.
—— *floribunda*, i. 436, 441.
—— glossostoma, i. 440.
—— graciliflora, i. 440.
—— *gracilis*, i. 445.
—— *gratioloides*, i. 443.
—— heteropetala, i. 440.
—— heterophylla, i. 440.
—— *heterophylla*, i. 446; iv. 36.
—— hookeriana, i. 441.
—— *hookeriana*, i. 442; iv. 285.
—— hyssopifolia, i. 441.
—— ignea, i. 441.
—— infundibulum, i. 441.
—— intermedia, i. 441.
—— ixodes, i. 441.
—— jorullensis, i. 442.
—— *jorullensis*, i. 443, 445.
—— karwinskii, i. 442.
—— laminuligera, i. 442.
—— lanceolata, i. 442.
—— *lanceolata*, i. 447.
—— leptopoda, i. 443.
—— liebmannii, i. 443.
—— llavea, i. 442.
—— *llavea*, iv. 36.
—— *llaveana*, i. 442.
Cuphea lobophora, i. 443.
—— lophostoma, i. 443.
—— *melanium*, i. 437.
—— *micrantha*, i. 443.
—— micrantha, iv. 37.
—— micropetala, i. 443.
—— microstyla, i. 443.
—— mimuloides, i. 443.
—— miniata, i. 443.
—— *minuta*, iv. 36.
—— nitidula, i. 444.
—— *nitidula*, i. 441, 447.
—— nudicostata, i. 444.
—— *ocimoides*, i. 436.
—— orthodisca, i. 444.
—— *orthodisca*, iv. 36.
—— palustris, i. 445.
—— *palustris*, iv. 36.
—— panamensis, i. 444.
—— pinetorum, i. 445.
—— *pinetorum*, i. 442.
—— *platycentra*, i. 438, 441.
—— procumbens, i. 445.
—— *procumbens*, iv. 36.
—— propinqua, i. 445.
—— *propinqua*, iv. 36.
—— *pseudo-melanium*, i. 437.
—— *pubiflora*, i. 439.
—— *purpurea*, i. 445.
—— rivularis, i. 446.
—— *rivularis*, i. 445.
—— *roezlii*, i. 441.
—— salicifolia, i. 446.
—— *scabrida*, i. 436.
—— secundiflora, i. 446.
—— serpyllifolia, i. 446.
—— setosa, i. 446.
—— *silenoides*, i. 442.
—— spicata, i. 446.
—— squamuligera, i. 446.
—— *strigillosa*, i. 439.
—— *strigulosa*, i. 439.
—— subuligera, i. 446.
—— *subuligera*, iv. 36.
—— tenella, i. 446.
—— *tenella*, i. 447.
—— ternata, i. 446.
—— *ternata*, i. 440; iv. 36.
—— tetrapetala, i. 446.
—— *tolukana*, i. 447.
—— *tricolor*, i. 442.
—— utriculosa, i. 447.
—— *utriculosa*, i. 445, 446.
—— *violacea*, i. 436.
—— *virgata*, i. 436.
—— wrightii, i. 447.
—— zimapani, i. 447.
CUPRESSINEÆ, iii. 183.
Cupressineæ, iv. 88.
CUPRESSUS, iii. 183.
Cupressus, iv. 265.
Cupressus arizonica, iv. 88.
—— benthami, iii. 183.
—— *coulteri*, iii. 183.
—— *ehrenbergii*, iii. 183.
—— *excelsa*, iii. 183.
—— *karwinskiana*, iii. 183.
—— *knightiana*, iii. 183.
—— lindleyi, iii. 183.
—— *sabinoides*, iii. 184.
—— thurifera, iii. 183.
—— uhdeana, iii. 183.
CUPULIFERÆ, iii. 165; iv. 87.
Cupuliferæ, iv. 194, 202, 217, 226, 260.
CURATELLA, i. 11.
Curatella americana, i. 11.
—— *americana*, iv. 162, 166.
Curcas cuneifolia, iii. 108.
CURVEMBRYEÆ, iii. 1.
CUSCUTA, ii. 401.
Cuscuta, iv. 74.
Cuscuta americana, ii. 401; iv. 105, 113.
—— applanata, ii. 401.
—— arvensis, ii. 401; iv. 74.
—— aurea, iv. 74.
—— *congesta*, ii. 401.
—— corymbosa, ii. 401.
—— decora, ii. 402.
—— *fœtida*, ii. 402.
—— *globulosa*, ii. 401.
—— gracillima, ii. 402.
—— gronovii, ii. 402.
—— *inclusa*, ii. 401.
—— *indecora*, ii. 402.
—— jalapensis, ii. 402.
—— *jalapensis*, iv. 147, 148.
—— *laxiflora*, ii. 401.
—— mitræformis, ii. 402.
—— odontolepis, iv. 74.
—— potosina, iv. 74.
—— *pulcherrima*, ii. 402.
—— salina, ii. 402.
—— sidarum, iv. 74.
—— squamata, ii. 402.
—— strobilacea, iv. 74.
—— *stylosa*, ii. 401.
—— tinctoria, ii. 403.
—— *trichostyla*, ii. 403.
—— umbellata, ii. 403.
—— *vulgivaga*, ii. 402.
CUSPARIEÆ, i. 166.
Cuspidaria furcata, iii. 682.

Cuspidaria semipinnatifida, iii. 682.
Cyanobotrys mexicana, i. 320.
Cyanophyllum magnificum, i. 427.
Cyanotis vittata, iii. 397.
—— *zebrina*, iii. 397.
CYATHEA, iii. 591.
Cyathea affinis, iii. 592.
—— arborea, iii. 591; iv. 115.
—— articulata, iii. 592.
—— aurea, iii. 592.
—— bicrenata, iii. 593.
—— *bourgæi*, iii. 591.
—— *denudans*, iii. 592.
—— divergens, iv. 115.
—— *fulva*, iii. 592.
—— *glauca*, iii. 591.
—— *hexagona*, iii. 592.
—— insignis, iii. 591.
—— jurgensenii, iii. 591.
—— mexicana, iii. 591.
—— *mexicana*, iii. 592.
—— *oligocarpa*, iii. 592.
—— *princeps*, iii. 591.
—— schanschin, iii. 592.
—— serra, iii. 592.
CYATHEÆ, iii. 591.
Cyathodes, iv. 233.
CYATHULA, iii. 14.
Cyathula achyranthoides, iii. 15.
CYBIANTHUS, ii. 290.
Cybianthus costaricanus, ii. 290.
Cybiostigma, i. 134.
—— *abutilifolium*, i. 134.
—— *sidæfolium*, i. 135.
CYCADACEÆ, iii. 190.
Cycadaceæ, iv. 195, 204, 267.
Cycas circinalis, iv. 267.
—— *revoluta*, iv. 267.
CYCLANTHACEÆ, iii. 416; iv. 92.
Cyclanthaceæ, iv. 198, 204, 277.
CYCLANTHERA, i. 488.
Cyclanthera angustifolia, i. 489.
—— angustiloba, i. 489.
—— biglandulifera, iv. 41.
—— bourgæana, i. 488.
—— brachystachya, i. 489.
—— costaricensis, i. 489.
—— dissecta, i. 489.
—— *dissecta*, iv. 41.
—— eremocarpa, i. 489.
—— *eremocarpa*, iv. 285.
—— explodens, i. 489.
—— filifera, i. 489.
—— gracillima, i. 489.
—— hastata, i. 489.
—— *hastata*, iv. 42.
Cyclanthera integrifoliola, i. 489.
—— langæi, i. 489.
—— multifoliata, iv. 41.
—— multifoliola, i. 489.
—— *multifoliola*, iv. 41.
—— naudiniana, iv. 41.
—— œrstedii, iv. 41.
—— pedata, i. 490.
—— ribiflora, i. 490.
—— tamnoides, i. 490; iv. 42.
—— trianæi, iv. 42.
—— trianæi, var. β. villosa, iv. 42.
CYCLANTHUS, iv. 92.
Cyclanthus bipartitus, iv. 92.
Cyclobothra, iii. 379.
—— *barbata*, iii. 380.
—— *flava*, iii. 380.
—— *fusca*, iii. 380.
—— *grandiflora*, iii. 380.
—— *hartwegii*, iii. 380.
—— *lutea*, iii. 380.
—— *pallida*, iii. 380.
—— *propinqua*, iii. 380.
—— *purpurea*, iii. 380.
Cyclodium meniscoides, iii. 643.
Cyclosia, iii. 261.
—— *maculata*, iii. 262.
Cyclostigma denticulatum, iii. 115.
—— *draco*, iii. 110.
—— *panamense*, iii. 115.
—— *xalapense*, iii. 117.
CYCNOCHES, iii. 263.
Cycnoches, iv. 152.
Cycnoches aureum, iii. 263.
—— *aureum*, iv. 295.
—— *barbatum*, iii. 263.
—— dianæ, iii. 263.
—— *egertonianum*, iii. 263.
—— ——, var. *viride*, iii. 263.
—— maculatum, iii. 263.
—— *pentadactylon*, iii. 263.
—— ventricosum, iii. 263.
—— *warscewiczii*, iii. 263.
Cydista æquinoctialis, ii. 490.
—— *diversifolia*, ii. 490.
—— *seemanni*, ii. 490.
Cymbidium altum, iii. 216.
—— *bituberculatum*, iii. 212.
—— *cordigerum*, iii. 226.
—— *echinocarpon*, iii. 268.
—— *glaucum*, iii. 268.
—— *globosum*, iii. 231.
—— *guttatum*, iii. 283.
—— *juncifolium*, iii. 280.
—— *lineare*, iii. 222.
—— *muricatum*, iii. 268.
—— *ochroleucum*, iii. 265.
Cymbidium pusillum, iii. 282.
—— *trichocarpon*, iii. 269.
—— *tripterum*, iii. 214.
—— *utriculatum*, iii. 250.
—— *verecundum*, iii. 215.
—— *vexilliferum*, iii. 212; iv. 89.
CYMBOPETALUM, i. 17.
Cymbopetalum penduliflorum, i. 18.
Cymbopogon condensatus, iii. 526.
—— *foliosus*, iii. 526.
—— *humboldtii*, iii. 525.
—— *melanocarpus*, iii. 524.
—— *reflexus*, iii. 526.
Cymburas mutabilis, ii. 532.
CYMOPTERUS, i. 569.
Cymopterus fendleri, i. 569.
Cynanchum fœtidum, ii. 329.
—— *lanceolatum*, ii. 328.
—— *nigrum*, ii. 332.
—— *prostratum*, ii. 333.
—— *racemosum*, ii. 329.
CYNAROIDEÆ, ii. 250.
Cynaroideæ, iv. 184.
CYNODON, iii. 557.
Cynodon dactylon, iii. 557.
—— *dactylon*, iii. 558.
—— *erectus*, iii. 558.
Cynoglossum mexicanum, ii. 377.
CYNOMETRA, i. 342.
Cynometra bauhiniæfolia, i. 342.
CYNOMETREÆ, i. 341.
Cynosurus domingensis, iii. 566.
—— *gracilis*, iii. 517.
—— *secundus*, iii. 563.
—— *tenellus*, iii. 517.
—— *virgatus*, iii. 566.
Cypella gracilis, iii. 326.
CYPERACEÆ, iii. 443; iv. 93, 109.
Cyperaceæ, iv. 120, 199, 202, 215, 217, 226, 231, 232, 234.
CYPERUS, iii. 444.
Cyperus, iii. 453; iv. 148, 213.
—— *acuminatus*, iii. 461.
—— acutiusculus, iii. 444.
—— alpinus, iii. 444.
—— amabilis, iii. 444.
—— *ambiguus*, iii. 450.
—— apiculatus, iii. 444.
—— aristatus, iii. 444.
—— articulatus, iii. 444.
—— aschenbornianus, iii. 445.
—— *asperrimus*, iii. 452.
—— atrosanguineus, iii. 445.
—— *aurantiacus*, iii. 444.
—— *aureus*, iii. 444.
—— bipontii, iii. 445.
—— brachystachys, iii. 445.

Cyperus breviradiatus, iii. 445.
—— *bromoides*, iii. 452.
—— brunneus, iv. 114.
—— camphoratus, iii. 445.
—— *canescens*, iii. 447.
—— canus, iii. 445.
—— caracasanus, iii. 445.
—— ciliatus, iii. 445.
—— compressus, iii. 445.
—— *correctus*, iii. 450.
—— cuspidatus, iii. 445.
—— cymbæformis, iii. 446.
—— dipsaceus, iii. 446.
—— discigerus, iii. 446.
—— dissitiflorus, iii. 446.
—— distans, iii. 446.
—— *divergens*, iii. 452.
—— *drummondii*, iii. 461.
—— ehrenbergianus, iii. 446.
—— elegans, iii. 446.
—— *elegans*, iv. 296.
—— esculentus, iii. 446.
—— *falciculosus*, iii. 444.
—— firmus, iii. 447.
—— *flavamariscus*, iii. 447; iv. 165.
—— flavescens, iii. 447.
—— flavicomus, iii. 447.
—— flavus, iii. 447.
—— flexuosus, iv. 114.
—— fossarum, iii. 447.
—— fragilis, iii. 447.
—— *fugax*, iii. 450.
—— fulvescens, iii. 447.
—— giganteus, iii. 447.
—— *glareosus*, iii. 444.
—— *gracilis*, iii. 448.
—— granadinus, iii. 448.
—— haspan, iii. 448.
—— *helvus*, iii. 450.
—— humboldtianus, iii. 448.
—— humilis, iii. 448.
—— *hydra*, iii. 446.
—— incompletus, iii. 448.
—— *inconspicuus*, iii. 449.
—— *inflexus*, iii. 444.
—— ischnos, iii. 448.
—— lævigatus, iii. 448.
—— lateriflorus, iii. 449.
—— laxus, iii. 446.
—— leucolepis, iii. 449.
—— liebmanni, iii. 449.
—— ligularis, iii. 449; iv. 109, 114.
—— macrocephalus, iii. 449.
—— *manimæ*, iii. 452.
—— melanostachyus, iii. 449.
—— mexicanus, iii. 449.
—— *microdontus*, iii. 450.
Cyperus mucronatus, iii. 448.
—— mutisii, iii. 449.
—— *nudus*, iii. 448.
—— obesus, iii. 450.
—— œrstedii, iii. 450.
—— olfersianus, iii. 450.
—— *oligostachyus*, iii. 444.
—— perpusillus, iii. 450.
—— *phymatodes*, iii. 446.
—— piceus, iii. 450.
—— polystachyus, iii. 450.
—— prolixus, iii. 450.
—— *pseudobromoides*, iii. 452.
—— *purshii*, iii. 444.
—— pycnostachyus, iii. 450.
—— pygmæus, iii. 451.
—— *pygmæus*, var. *aztecorum*, iii. 451.
—— *rotundus*, iii. 446.
—— rufinus, iii. 451.
—— ruizianus, iii. 451.
—— *scaberrimus*, iii. 452.
—— schaffneri, iii. 451; iv. 93.
—— schweinitzii, iii. 451.
—— selloanus, iii. 451.
—— semiochraceus, iii. 451.
—— sertularinus, iii. 451.
—— seslerioides, iii. 451.
—— *seslerioides*, iv. 296.
—— simplex, iii. 451.
—— spectabilis, iii. 451.
—— sphacelatus, iii. 452.
—— squalidus, iii. 452.
—— *squamosus*, iii. 444.
—— surinamensis, iii. 452; iv. 114.
—— *tenerrimus*, iii. 448.
—— tetragonus, iii. 452.
—— *texensis*, iii. 450.
—— thyrsiflorus, iii. 452; iv. 109.
—— tolucensis, iii. 446.
—— *triceps*, iii. 452.
—— unioloides, iii. 452.
—— *variegatus*, iii. 449.
—— vegetus, iii. 452.
—— virens, iii. 453.
—— viscosus, iii. 453.
CYPHOMANDRA, ii. 417.
Cyphomandra allophylla, ii. 417.
—— *betacea*, ii. 417.
—— hartwegii, ii. 417.
—— tegorea, ii. 417.
—— viridiflora, ii. 417.
Cyphomanthemum macradenia, iii. 42.
CYPRIPEDIEÆ, iii. 307.
Cypripedieæ, iv. 196.
CYPRIPEDIUM, iii. 307.
Cypripedium, iv. 271.
Cypripedium caudatum, iii. 307.
—— irapeanum, iii. 307.
—— *irapeanum*, iv. 301, 303.
—— *lexarzæ*, iii. 307.
—— *longifolium*, iii. 308.
—— *molle*, iii. 307.
—— *splendidum*, iii. 307.
—— *warscewiczianum*, iii. 307.
Cyrilla pulchella, ii. 473.
Cyrillaceæ, iv. 177.
Cyrtandreæ, ii. 472.
Cyrtanthemum deflexum, ii. 488.
—— *hirsutum*, ii. 488.
Cyrtanthera aurea, ii. 520.
—— *catalpæfolia*, ii. 520.
—— *chrysostephana*, ii. 520.
—— *densiflora*, ii. 520.
—— *macrantha*, ii. 521.
—— *umbrosa*, ii. 520.
Cyrtantherella macrantha, ii. 521.
Cyrtocarpa copalillo, i. 222.
—— procera, iv. 25.
—— *procera*, i. 222.
Cyrtochilum bictoniense, iii. 274.
—— *citrinum*, iii. 281.
—— *filipes*, iii. 282.
—— *graminifolium*, iii. 282.
—— *jurgensenianum*, iii. 282.
—— *karwinskii*, iii. 276.
—— *leucochilum*, iii. 283.
—— *maculatum*, iii. 283; iv. 301.
—— *maculatum*, var., iii. 283.
—— *maculatum*, var. *parviflorum*, iii. 283.
Cyrtodeira chontalensis, ii. 482.
—— *cupreata*, ii. 482.
Cyrtomium juglandifolium, iii. 642.
—— *juglandifolium*, iii. 642.
—— *lindeni*, iii. 643.
—— *nobile*, iii. 642.
—— *pumilum*, iii. 643.
—— *remotisporum*, iii. 643.
Cyrtopera longifolia, iii. 249.
—— *longifolia*, var. ? *pachystelidia*, iii. 249.
—— *woodfordii*, iii. 249.
Cyrtophlebium angustifolium, iii. 654.
CYRTOPODIUM, iii. 249.
Cyrtopodium, iv. 300, 304.
Cyrtopodium punctatum, iii. 249.
—— *punctatum*, iv. 270.
—— woodfordii, iii. 249.
CYSTOPTERIS, iii. 605.
Cystopteris, iii. 604.
—— *acuta*, iii. 605.
—— fragilis, iii. 605.
—— *fragilis*, iv. 297.

Cystopteris fumarioides, iii. 605.
CYTINACEÆ, iii. 40.
Cytinaceæ, iv. 191.
Cytineæ, iv. 205.
CYTINUS, iii. 40.
Cytinus americanus, iii. 40.
—— *americanus*, iii. 41.
—— andrieuxii, iii. 41.
Cyttarospermum tenerum, iv. 85.

Dactyloctenium ægyptiacum, iii. 565; iv. 114.
—— *mucronatum*, iii. 565.
—— *prostratum*, iii. 565.
DAHLIA, ii. 196.
Dahlia, iv. 147.
—— *bidentifolia*, ii. 196.
—— *cervantesii*, ii. 196.
—— coccinea, ii. 196.
—— *crocata*, ii. 197.
—— *decaisneana*, ii. 197.
—— excelsa, ii. 196.
—— *glabrata*, ii. 197.
—— gracilis, ii. 196.
—— imperialis, ii. 197.
—— maximiliana, ii. 197.
—— merckii, ii. 197.
—— *minor*, ii. 197.
—— *pinnata*, ii. 197.
—— *rosea*, ii. 197.
—— *sambucifolia*, ii. 197.
—— scapigera, ii. 197.
—— *superflua*, ii. 197.
—— variabilis, ii. 197.
—— *variabilis*, iv. 149.
DALBERGIA, i. 313.
Dalbergia amerimnum, i. 313.
—— calycina, i. 313.
—— campeachiana, i. 313.
—— *campeachiana*, i. 314.
—— glomerata, i. 313.
—— retusa, i. 314.
DALBERGIEÆ, i. 313.
DALEA, i. 236.
Dalea, iv. 141, 212, 233, 239.
Dalea acutifolia, i. 237.
—— albiflora, i. 237.
—— alopecuroides, i. 237.
—— argyræa, i. 237.
—— argyrostachys, i. 237.
—— *argyrostachys*, i. 242.
—— *aristata*, i. 243.
—— aurea, iv. 26.
—— ayavacensis, i. 237.
—— berlandieri, i. 237; iv. 26.
—— *bicolor*, i. 243.
—— brachystachys, i. 237.
Dalea brachystachys, i. 240.
—— *brevidens*, i. 239.
—— calycosa, i. 237.
—— canescens, i. 237.
—— cinerea, i. 238.
—— citriodora, i. 238.
—— *citriodora*, i. 239, 245, 249.
—— cliffortiana, i. 238.
—— comosa, i. 238.
—— crassifolia, i. 238.
—— *crenulata*, i. 244.
—— decora, i. 238.
—— *decora*, i. 245.
—— diffusa, i. 238.
—— *divaricata*, i. 246.
—— domingensis, i. 239.
—— *dorycnoides*, i. 245.
—— ehrenbergii, i. 239.
—— elata, i. 239.
—— *elegans*, i. 244.
—— emoryi, i. 239.
—— *emoryi*, iii. 41.
—— eriophylla, iv. 26.
—— ervoides, i. 239.
—— eysenhardtioides, i. 240.
—— filiformis, i. 240.
—— flava, i. 240.
—— *flava*, i. 247.
—— flavorosea, i. 240.
—— formosa, i. 241.
—— frutescens, i. 241; iv. 26.
—— *gracilis*, i. 238.
—— greggii, i. 241; iv. 26.
—— guatemalensis, i. 241.
—— hypoglottidea, i. 241.
—— inconspicua, i. 241.
—— *inconspicua*, i. 240.
—— insignis, i. 241.
—— lachnantha, i. 242.
—— lachnostachys, i. 242.
—— lævigata, i. 242.
—— lagopus, i. 242.
—— lanuginosa, i. 242.
—— lasiathera, iv. 26.
—— lasiostachya, i. 242.
—— laxiflora, i. 242.
—— *leporina*, i. 237.
—— leptoclados, i. 242.
—— leucostachys, i. 242.
—— *leucostachys*, i. 240.
—— leucostoma, i. 242.
—— luisana, iv. 26.
—— lutea, i. 243.
—— macrostachya, i. 243.
—— macrotropis, i. 243.
—— megacarpa, iv. 27.
—— melantha, i. 243.
Dalea microphylla, i. 243.
—— mollis, i. 243.
—— mucronata, i. 243.
—— mutabilis, i. 243.
—— nana, i. 243; iv. 27.
—— naviculifolia, i. 243.
—— nigra, i. 244.
—— *nigra*, i. 249.
—— nutans, i. 244.
—— *ovalifolia*, i. 243.
—— pectinata, i. 244.
—— *pectinata*, i. 238.
—— phymatodes, i. 244.
—— *phymatodes*, i. 241.
—— platystegia, i. 244.
—— pogonathera, i. 244; iv. 27.
—— polycephala, i. 244.
—— *polygonoides*, i. 240.
—— polyphylla, i. 245.
—— *polyphylla*, i. 238, 248.
—— procumbens, i. 245.
—— prostrata, i. 245.
—— *prostrata*, i. 247.
—— *psoraleoides*, i. 248.
—— pulchella, i. 245.
—— pyramidalis, i. 245.
—— radicans, iv. 27.
—— ramosissima, i. 245.
—— *ramosissima*, i. 238, 244.
—— reclinata, i. 245.
—— schaffneri, i. 246.
—— *schaffneri*, i. 244.
—— schottii, i. 246.
—— scoparia, i. 246.
—— sericea, i. 246.
—— similis, i. 246.
—— *similis*, i. 241.
—— spinescens, i. 247.
—— spinosa, i. 247.
—— *tephrosioides*, iv. 239.
—— thymoides, i. 247.
—— thyrsiflora, i. 247.
—— *tomentosa*, i. 248.
—— *trifoliata*, i. 248.
—— *trifoliolata*, i. 247.
—— triphylla, i. 247.
—— tuberculata, i. 247.
—— *tuberculata*, i. 249.
—— uncifera, i. 247.
—— velutipes, i. 248.
—— verbenacea, i. 248.
—— versicolor, i. 248.
—— virgata, i. 248.
—— *vulnaria*, var., i. 244.
—— *vulneraria*, i. 239.
—— wislizeni, i. 248.
—— wrightii, i. 248.

Dalea wrightii, iv. 27.
—— zimapanica, i. 248.
—— zuccarinii, i. 248.
DALECHAMPIA, iii. 132.
Dalechampia fimbriata, iii. 133.
—— friedrichsthalii, iii. 132.
—— genuina, iii. 132.
—— mollis, iii. 133.
—— roezliana, iii. 132.
—— scandens, iii. 132.
—— spathulata, iii. 133.
—— tiliæfolia, iii. 133.
—— triphylla, iii. 133.
DALEMBERTIA, iii. 137.
Dalembertia, iv. 260.
Dalembertia hahniana, iii. 137.
—— platanoides, iii. 137.
—— populifolia, iii. 137.
—— triangularis, iii. 137.
DANÆA, iii. 696.
Danæa, iv. 280, 281.
Danæa alata, iii. 696.
—— crispa, iii. 696.
—— cuspidata, iii. 696.
—— elliptica, iii. 697.
—— *geniculata*, iii. 697.
—— *media*, iii. 697.
—— moritziana, iii. 697; iv. 116.
—— nodosa, iii. 697.
—— *stenophylla*, iii. 696.
—— wendlandii, iii. 697.
Danthonia, iii. 555.
DAPHNALES, iii. 70.
Daphne bonplandiana, iii. 79.
—— *cestrifolia*, iii. 79.
—— *mexicana*, iii. 79.
—— *salicifolia*, iii. 79.
Daphnidostaphylis pungens, ii. 279.
—— *tomentosa*, ii. 279.
DAPHNOPSIS, iii. 79.
Daphnopsis, iv. 302.
Daphnopsis bonplandii, iii. 79.
—— cestrifolia, iii. 79.
—— lindeni, iii. 79.
—— mollis, iii. 79.
—— salicifolia, iii. 79.
Darea cicutaria, iii. 632.
—— *myriophylla*, iii. 632.
—— solmsii, iii. 639.
—— *thecifera*, iii. 605.
Darlingtonia, i. 26.
Dasycarpus quadrivalvis, i. 142.
DASYCARYA, i. 222.
Dasycarya grisea, i. 222.
DASYCEPHALA, ii. 56.
Dasycephala indecora, ii. 57.
DASYLIRION, iii. 373.
Dasylirion, iv. 140, 272, 273, 309.
Dasylirion acrotrichum, iii. 373.
—— berlandieri, iii. 373.
—— *cæspitosum*, iii. 373.
—— glaucophyllum, iii. 373.
—— *glaucum*, iii. 373.
—— *gracile*, iii. 373.
—— graminifolium, iii. 373.
—— *graminifolium*, iii. 373.
—— *hartwegianum*, iii. 371, 373.
—— hookeri, iii. 373.
—— *humboldtii*, iii. 372.
—— *junceum*, iii. 371.
—— *laxiflorum*, iii. 374.
—— *lindheimerianum*, iii. 372.
—— *longifolium*, iii. 372.
—— *pitcairniæfolium*, iii. 318.
—— pliabile, iii. 374.
—— quadrangulatum, iii. 374.
—— serratifolium, iii. 374.
—— *serratifolium*, iii. 373.
—— *tenuifolium*, iii. 372.
—— *wheeleri*, iii. 374.
Dasystachys deckeriana, iii. 404.
Dasystoma greggii, iv. 77.
—— *laciniata*, ii. 458.
DATISCA, i. 500.
Datisca glomerata, i. 501.
DATISCACEÆ, i. 500; iv. 181, 205, 217, 225.
Datisceæ, i. 500.
DATURA, ii. 427.
Datura arborea, ii. 427.
—— *arborea*, ii. 428.
—— ceratocaula, ii. 427.
—— cornigera, ii. 427.
—— discolor, ii. 427.
—— ferox, ii. 428.
—— metel, ii. 428.
—— meteloides, ii. 428.
—— quercifolia, ii. 428; iv. 75.
—— sanguinea, ii. 428.
—— stramonium, ii. 428; iv. 105.
—— *stramonium*, var. *tatula*, ii. 428.
—— suaveolens, ii. 428.
—— tatula, ii. 428.
—— *thomasii*, ii. 427.
—— *wrightii*, ii. 428.
Daubentonia longifolia, iv. 27.
—— *thurberi*, i. 270.
DAUCUS, i. 571.
Daucus, i. 570.
—— *brachiatus*, iv. 234.
—— brachiatus, i. 571.
—— carota, i. 571.
—— montanus, i. 571.
—— *montanus*, iv. 149.
Daucus pusillus, i. 571.
—— *scaber*, i. 571.
—— *toriloides*, i. 571.
DAVALLIA, iii. 604.
Davallia concinna, iii. 605.
—— *divaricata*, iii. 605.
—— imrayana, iv. 115.
—— inæqualis, iii. 605; iv. 115.
—— *lindeni*, iii. 605.
—— saccoloma, iii. 605.
—— *schimperi*, iii. 605.
—— schlechtendalii, iii. 605; iv. 115.
—— thecifera, iii. 605.
DAVALLIEÆ, iii. 604.
DAVILLA, i. 11.
Davilla brasiliana, i. 11.
—— kunthii, i. 11.
—— *lucida*, i. 11.
—— *multiflora*, i. 11.
—— *ovata*, i. 11.
—— rugosa, i. 11.
—— sagræana, i. 11.
Davya adscendens, i. 421.
—— *guyanensis*, i. 421.
—— *macrophylla*, i. 421.
DECACHÆTA, ii. 78.
Decachæta hænkeana, ii. 78.
—— seemannii, ii. 78.
DECATROPIS, i. 169.
Decatropis coulteri, i. 169.
DECLIEUXIA, ii. 52.
Declieuxia galeottii, ii. 53.
—— mexicana, ii. 53.
DEHERAINIA, ii. 294.
Deherainia smaragdina, ii. 294.
DEKINIA, ii. 551.
Dekinia, iv. 258.
Dekinia coccinea, ii. 551.
—— *coccinea*, iv. 292.
Delima mexicana, i. 13.
DELIMEÆ, i. 11.
Delostoma latifolia, ii. 494.
DELPHINIUM, i. 9.
Delphinium, iv. 235.
Delphinium azureum, iv. 3.
—— bicornutum, i. 9.
—— latisepalum, i. 9.
—— *latisepalum*, iv. 282.
—— leptophyllum, i. 9; iv. 3.
—— pedatisectum, i. 10.
—— wislizeni, i. 10.
Delucia ostruthioides, ii. 203.
Demetria spathulata, ii. 112.
Dendrobium aloideum, iv. 89.
—— *bracteatum*, iv. 89.
—— *corniculatum*, iii. 198.

Dendrobium polystachyon, iii. 248.
—— *quadrifidum*, iii. 201.
—— *retusum*, iii. 201.
—— *ruscifolium*, iii. 201.
—— *scariosum*, iii. 201.
—— *tribuloides*, iii. 202.
—— *utricularioides*, iii. 290.
Dendrodaphne macrophylla, iii. 77.
DENDROPANAX, i. 572.
Dendropanax, iv. 229.
Dendropanax alaris, i. 572.
—— arboreum, i. 572.
—— citrifolium, i. 572.
—— jurgenseni, i. 573.
—— langeanum, i. 573.
DENDROPHTHORA, iii. 84.
Dendrophthora biserrula, iii. 84.
Dennstædtia dissecta, iii. 597.
—— *glabrescens*, iii. 597.
—— *ordinata*, iii. 596.
—— *rubiginosa*, iii. 597.
—— *tenera*, iii. 596.
DEPPEA, ii. 26.
Deppea, iv. 249.
Deppea cornifolia, ii. 26.
—— costaricensis, ii. 26.
—— erythrorhiza, ii. 26.
—— floribunda, ii. 27.
—— grandiflora, ii. 27.
—— *hedyotidea*, ii. 26.
—— obtusiflora, ii. 27.
—— pubescens, ii. 27.
—— tenuiflora, ii. 27.
—— umbellata, ii. 28.
DERMATOCALYX, ii. 448.
Dermatocalyx parviflorus, ii. 448.
Dermatophyllum speciosum, i. 321.
Descantaria, iii. 392.
DESCHAMPSIA, iii. 555.
Deschampsia cæspitosa, iii. 555.
—— kœlerioides, iii. 555.
—— *kœlerioides*, iv. 297.
—— *nitida*, iii. 554.
DESMANTHODIUM, ii. 142.
Desmanthodium guatemalense, ii. 142.
—— ovatum, ii. 142.
—— *ovatum*, iv. 288.
—— perfoliatum, ii. 142.
DESMANTHUS, i. 345.
Desmanthus, iv. 230.
Desmanthus depressus, i. 345; iv. 112.
—— incurvus, i. 345; iv. 32.
—— leptolobus, i. 345.
—— *leptophyllus*, i. 345.
—— virgatus, i. 345; iv. 32.
Desmochæta achyranthoides, iii. 15.
DESMODIUM, i. 273.
Desmodium, iv. 147, 213, 239.
Desmodium acuminatum, i. 274.
—— adhæsivum, i. 274.
—— adscendens, i. 274; iv. 29, 99.
—— *adscendens*, iv. 230.
—— affine, i. 274.
—— alamani, i. 274.
—— albiflorum, i. 274.
—— ambiguum, i. 274.
—— amplifolium, i. 274.
—— *amplifolium*, iv. 284.
—— *ancistrocarpum*, i. 280.
—— angustifolium, i. 275.
—— *angustifolium*, i. 281, 287.
—— annuum, i. 275.
—— *aparines*, i. 290.
—— *axillare*, i. 275, 281.
—— axillare, iv. 29.
—— barbatum, i. 275.
—— barclayi, i. 275.
—— batocaulon, i. 276.
—— bigelowii, i. 276.
—— brachystachyum, i. 275.
—— *bracteosum*, i. 277.
—— cajanifolium, i. 276.
—— callilepis, i. 276.
—— *callilepis*, i. 280.
—— campyloclados, i. 276.
—— *canadense*, i. 279, 282.
—— cinerascens, i. 277.
—— cinereum, i. 277.
—— cordistipulum, i. 277.
—— *cuspidatum*, i. 277.
—— densiflorum, i. 277.
—— *densiflorum*, i. 285.
—— *dillenii*, i. 290.
—— diversifolium, i. 278.
—— elegans, i. 278.
—— exiguum, i. 278.
—— foliosum, i. 278.
—— *foliosum*, i. 283.
—— ghiesbreghtii, i. 279.
—— glabrum, i. 279.
—— gracile, i. 279.
—— hartwegianum, i. 279.
—— helleri, i. 280.
—— heterophyllum, i. 280.
—— hirsutum, i. 280.
—— incanum, i. 280; iv. 29, 112.
—— *incanum*, i. 278; iv. 230.
—— infractum, i. 280.
—— lamprocarpum, i. 280.
—— leptoclados, i. 281.
—— *leptoclados*, i. 285.
—— limense, i. 281.
Desmodium linearifolium, i. 281.
—— *linearifolium*, i. 287.
—— lupulinum, i. 281.
—— macropodium, i. 281.
—— macrostachyum, i. 282.
—— madrense, i. 282.
—— molle, i. 283.
—— molliculum, i. 283; iv. 29.
—— neo-mexicanum, i. 283.
—— nicaraguense, i. 283.
—— nitidum, i. 283.
—— *nitidum*, i. 278, 280; iv. 284.
—— orbiculare, i. 283.
—— orizabanum, i. 284.
—— palmeri, i. 284.
—— paniculatum, i. 285.
—— *paniculatum*, i. 282.
—— parkinsoni, i. 285.
—— parryi, i. 285.
—— parviflorum, i. 285.
—— plectocarpum, i. 286.
—— plicatum, i. 286.
—— podocarpum, i. 286.
—— polystachyum, i. 286.
—— prehensile, i. 286.
—— psilocarpum, i. 286.
—— psilophyllum, i. 287; iv. 29.
—— *radicans*, i. 275.
—— *reptans*, i. 275.
—— retinens, i. 287.
—— salvinii, i. 287.
—— scorpiurus, i. 287.
—— scutatum, i. 287.
—— *scutatum*, i. 289.
—— sericocarpum, i. 288.
—— sericophyllum, i. 288.
—— serotinum, i. 288.
—— *sessilifolium*, i. 279.
—— *sinclairi*, i. 290.
—— skinneri, i. 288.
—— *skinneri*, var. *albo-lineatum*, i. 288.
—— ——, var. *albo-nitens*, i. 288.
—— sonoræ, i. 289.
—— spirale, i. 289; iv. 29.
—— *spirale*, i. 275, 276.
—— stipulaceum, i. 289.
—— *stipulaceum*, i. 290.
—— strictum, i. 289.
—— strobilaceum, i. 289.
—— *strobilaceum*, i. 275, 278, 279, 285.
—— subsessile, i. 289.
—— subtile, i. 290.
—— tortuosum, i. 290.
—— triflorum, i. 290.
—— uncinatum, i. 290.

Desmodium venustulum, i. 290.
—— villosum, i. 291.
—— viridiflorum, i. 291; iv. 29.
—— wislizeni, i. 291.
—— wislizenii, iv. 29.
DESMONCUS, iii. 413.
Desmoncus, iv. 152.
Desmoncus chinantlensis, iii. 413.
—— oxycanthos, iii. 414.
Despretzia mexicana, iii. 577.
DEUTZIA, i. 384.
Deutzia, i. 385; iv. 229, 240.
Deutzia mexicana, i. 384.
DEYEUXIA, iii. 553.
Deyeuxia, iii. 532, 554; iv. 149.
—— *capillaris*, iii. 580.
—— eriantha, iii. 553.
—— evoluta, iii. 553.
—— *evoluta*, iv. 297.
—— gracilis, iii. 554.
—— junciformis, iii. 554.
—— *junciformis*, iv. 297.
—— liebmanniana, iii. 554.
—— *liebmanniana*, iv. 297.
—— orizabæ, iii. 554.
—— *orizabæ*, iv. 297, 305.
—— *poæformis*, iii. 580.
—— *quadriflora*, iii. 554.
—— *recta*, iii. 554.
—— schaffneri, iii. 554.
—— schiedeana, iii. 554.
—— *schiedeana*, iv. 297.
—— tolucensis, iii. 554.
—— *tolucensis*, iv. 297.
—— triflora, iii. 554.
—— *triflora*, iv. 297.
—— viridis, iii. 555.
DIACRIUM, iii. 221.
Diacrium bidentatum, iii. 221.
—— bigibberosum, iii. 222.
—— bilamellatum, iii. 222.
Diadenaria articulata, iii. 89.
—— *involucrata*, iii. 89.
—— *pavonia*, iii. 89.
Dialesta discolor, ii. 75.
DIANTHERA, ii. 517.
Dianthera anagallis, ii. 517.
—— breviflora, ii. 517.
—— candelariæ, ii. 517.
—— candicans, ii. 517.
—— ciliata, ii. 518.
—— comata, ii. 518.
—— glabra, ii. 518.
—— inæqualis, ii. 518.
—— latifolia, ii. 518.
—— lindeniana, ii. 518.
—— mexicana, ii. 518.
Dianthera multiflora, ii. 525.
—— parvifolia, ii. 519.
—— pectoralis, ii. 519.
—— secunda, ii. 519.
DIANTHUS, i. 66.
Diapensiaceæ, ii. 285; iv. 185.
DIAPERIA, ii. 135.
Diaperia multicaulis, ii. 135.
Diaphoranthema recurvata, iii. 322.
—— *uniflora*, iii. 322.
DIASTEMA, ii. 477.
Diastema bracteosum, ii. 477.
—— cristatum, ii. 477.
—— *gloxiniflorum*, ii. 473.
—— *gracile*, ii. 477.
Diastemanthe, iii. 509.
—— *platystachys*, iii. 509.
Diastemella, ii. 477.
—— *bracteosa*, ii. 477.
Diazeuxis, ii. 254.
—— *latifolia*, ii. 254.
—— *serrata*, ii. 71, 254.
Dicalymma, ii. 192.
DICHÆA, iii. 268.
Dichæa, iv. 152.
Dichæa brachypoda, iii. 268.
—— echinocarpa, iii. 268.
—— *echinocarpa*, iii. 269; iv. 270, 302.
—— glauca, iii. 268.
—— *latifolia*, iii. 269.
—— muricata, iii. 268.
—— *muricata*, iii. 269.
—— œrstedii, iii. 269.
—— panamensis, iii. 269.
—— squarrosa, iii. 269.
—— *squarrosa*, iv. 302.
—— trichocarpa, iii. 269.
—— *trichocarpa*, iv. 270.
—— trulla, iii. 269.
Dichætophora campestris, ii. 120.
Dichasium parallelogrammum, iii. 647.
—— *patentissimum*, iii. 647.
DICHONDRA, ii. 400.
Dichondra argentea, ii. 400.
—— *macrocalyx*, ii. 400.
—— repens, ii. 400.
—— *sericea*, ii. 400.
DICHORISANDRA, iii. 389.
Dichorisandra aubletiana, iii. 389.
—— *longifolia*, iii. 393.
—— mexicana, iii. 390.
—— ovalifolia, iii. 390.
—— persicariæfolia, iii. 389.
—— *warscewicziana*, iii. 394.
DICHROMENA, iii. 457.
Dichromena, iii. 458; iv. 231.
—— *ciliata*, iii. 457.
—— *globosa*, iii. 457.
—— *gracilis*, iii. 467.
—— *humboldtiana*, iii. 458.
—— leucocephala, iii. 457.
—— *micrantha*, iii. 466.
—— nervosa, iii. 457.
—— pubera, iii. 458.
—— *pura*, iii. 457.
—— *radicans*, iii. 458.
—— *robusta*, iii. 467.
—— *schiedeana*, iii. 465.
—— *tenuis*, iii. 458.
Dichrophyllum marginatum, iii. 101.
DICKSONEÆ, iii. 595.
DICKSONIA, iii. 596.
Dicksonia, iii. 595.
Dicksonia adiantoides, iii. 596.
—— apiifolia, iii. 596.
—— cicutaria, iii. 596; iv. 115.
—— *coniifolia*, iii. 597.
—— *cornuta*, iii. 596.
—— *dissecta*, iii. 596, 597.
—— *distenta*, iii. 596, 597.
—— *erosa*, iii. 596.
—— *exaltata*, iii. 596.
—— guatemalensis, iii. 596.
—— incisa, iv. 115.
—— multifida, iii. 597.
—— *ordinata*, iii. 596.
—— regalis, iii. 596.
—— rubiginosa, iii. 597; iv. 115.
—— schiedei, iii. 597.
—— sellowiana, iii. 597.
—— *tenera*, iii. 596.
—— *umbrosa*, iii. 597.
—— wendlandi, iii. 597.
DICLIPTERA, ii. 524.
Dicliptera acuminata, ii. 524.
—— assurgens, ii. 524; iv. 106, 113.
—— *assurgens*, ii. 525.
—— hænkeana, ii. 524.
—— mollis, ii. 524.
—— multiflora, ii. 525.
—— peduncularis, ii. 525.
—— pseudoverticillaris, iv. 80.
—— resupinata, ii. 525.
—— *scorpioides*, ii. 526.
—— sexangularis, ii. 525.
—— spicata, ii. 524.
—— trifurcata, ii. 525.
—— unguiculata, ii. 525.
DICORIA, ii. 149.
Dicoria brandegei, ii. 149.
Dicotyledones, iv. 201, 223.

DICRANOCARPUS, ii. 143.
Dicranocarpus parviflorus, ii. 144; iv. 54.
DICRAURUS, iii. 22.
Dicraurus leptocladus, iii. 22.
Dicrypta baueri, iii. 265.
—— *elatior,* iii. 265.
DICTYANTHUS, ii. 329.
Dictyanthus campanulatus, ii. 329.
—— parviflorus, ii. 329.
—— pavonii, ii. 329.
—— picturatus, ii. 332.
—— reflexus, ii. 333.
—— reticulatus, ii. 329.
—— stapeliæflorus, ii. 329.
Dictyopteris nicotianæfolia, iii. 665.
—— tatei, iii. 670.
DICTYOXIPHIUM, iii. 606.
Dictyoxiphium, iv. 280, 281.
Dictyoxiphium panamense, iii. 606.
DICYRTA, ii. 477.
Dicyrta candida, ii. 477.
—— *parviflora,* ii. 489.
—— warscewicziana, ii. 477.
DIDYMÆA, ii. 66.
Didymæa mexicana, ii. 66.
—— *mexicana,* iv. 287.
DIDYMOCHLÆNA, iii. 641.
Didymochlæna lunulata, iii. 641; iv. 116.
—— *sinuosa,* iii. 641.
Didymodon, iv. 150.
Didymoglossum kraussii, iii. 602.
—— *reptans,* iii. 603.
—— *reptans,* var. *β. schaffneri,* iii. 603.
DIDYMOPANAX, i. 572.
Didymopanax speciosum, i. 572.
Diectomis angustatus, iii. 525.
—— *laxa,* iii. 525.
DIEFFENBACHIA, iii. 425.
Dieffenbachia œrstedii, iii. 425.
Dienia calycina, iii. 210.
—— *crispata,* iii. 209.
—— *cordata,* iii. 209.
—— *majanthemifolia,* iii. 210.
—— *myurus,* iii. 210.
Dieteria coronopifolia, ii. 123.
—— *incana,* ii. 121.
Digitaria filiformis, iii. 478.
—— *fimbriata,* iii. 488.
—— *marginata,* iii. 491; iv. 165.
—— *sanguinalis,* iii. 496.
—— *setigera,* iii. 489.
DIGNANTHE, iii. 273.
Dignanthe pigmæa, iii. 273.
DILLENIACEÆ, i. 11.
Dilleniaceæ, iv. 171, 204, 216.
DIMORPHANDRA, i. 342.
Dimorphandra oleifera, i. 342.
DIMORPHANDREÆ, i. 342.
DIMORPHOSTACHYS, iii. 499.
Dimorphostachys adoperiens, iii. 499.
—— botterii, iii. 499.
—— drummondii, iii. 499.
—— ghiesbreghtii, iii. 499.
—— langei, iii. 499.
—— monostachya, iii. 499.
—— oajacensis, iii. 499.
—— paspaloides, iii. 499.
—— schaffneri, iii. 499.
—— variabilis, iii. 499.
Dinebra, iii. 560.
—— *aristidoides,* iii. 561.
—— *bromoides,* iii. 561.
—— *chondrosioides,* iii. 561.
—— *curtipendula,* iii. 563.
—— *paleacea,* iv. 270.
—— *repens,* iii. 561.
Dinema paleaceum, iii. 226.
—— *polybulbon,* iii. 237.
DIOCLEA, i. 302.
Dioclea guianensis, i. 302.
—— lasiocarpa, i. 302.
—— *panamensis,* i. 302.
—— reflexa, i. 302.
—— violacea, i. 302.
DIODIA, ii. 55.
Diodia, ii. 56; iv. 148, 149, 231, 249.
Diodia conferta, ii. 55.
—— crassifolia, ii. 55.
—— longiseta, ii. 55.
—— prostrata, ii. 55.
—— radula, ii. 55.
—— rigida, ii. 55.
—— sarmentosa, ii. 56.
—— setigera, ii. 56.
—— teres, ii. 56.
—— tetracocca, ii. 56; iv. 48.
—— *tricocca,* ii. 56; iv. 48.
—— villosa, ii. 56.
Diomedea bidentata, ii. 169.
DIOON, iii. 191.
Dioon, iii. 192.
—— *aculeatum,* iii. 191.
—— *angustifolium,* iii. 191.
—— edule, iii. 191.
—— *imbricatum,* iii. 191.
—— latipinna, iii. 191.
—— spinulosum, iii. 191.
—— *strobilaceum,* iii. 191.
—— *strobilosum,* iii. 191.
DIOSCOREA, iii. 353.
Dioscorea, iii. 361.
—— *billbergiana,* iii. 358.
—— brachycarpa, iii. 354.
—— *capillaris,* iii. 362.
—— cayennensis, iii. 354.
—— composita, iii. 354.
—— *composita,* iii. 362.
—— convolvulacea, iii. 355.
—— *convolvulacea,* iii. 362.
—— cuspidata, iii. 355.
—— cymosula, iii. 355.
—— *cymosula,* iii. 361.
—— densiflora, iii. 356; iv. 114.
—— *densiflora,* iii. 362.
—— *deppei,* iii. 358.
—— floribunda, iii. 356.
—— *floribunda,* iii. 357, 361.
—— galeottiana, iii. 356.
—— *galeottiana,* iii. 362.
—— glabra, iii. 354.
—— grandifolia, iii. 357.
—— *grandifolia,* iii. 362.
—— hirsuta, iii. 357.
—— *laxiflora,* iii. 360.
—— leiboldiana, iii. 357.
—— *macrophylla,* iii. 358.
—— macrostachya, iii. 357.
—— *macrostachya,* iii. 354, 362.
—— multinervis, iii. 358.
—— *multinervis,* iii. 362.
—— *nana,* iii. 358.
—— pallens, iii. 358.
—— *pallens,* iii. 359, 362.
—— polygonoides, iii. 359, 362.
—— *polygonoides,* iii. 358.
—— propinqua, iii. 359.
—— *propinqua,* iii. 362.
—— remotiflora, iii. 360.
—— sapindoides, iii. 360.
—— *sapindoides,* iii. 361.
—— *schlechtendalii,* iii. 358.
—— *sparsiflora,* iii. 359, 361.
—— sparsiflora, iii. 360.
—— spiculiflora, iii. 361.
—— *spiculiflora,* iii. 362.
—— tenuiflora, iii. 361.
—— urophylla, iii. 361.
DIOSCOREACEÆ, iii. 353.
Dioscoreaceæ, iv. 196, 204.
Diospyros, iv. 309.
DIOSPYROS, ii. 300.
Diospyros acapulcensis, ii. 300.
—— *albens,* ii. 300.
—— ciliata, ii. 300.
—— cuneifolia, ii. 300.
—— ebenaster, ii. 300.

Diospyros obtusifolia, ii. 300.
—— texana, ii. 300; iv. 67.
—— *texana*, iv. 140.
—— velutina, ii. 300.
Diothonæa oppositifolia, iii. 219.
Diphalangium, iii. 377.
—— *graminifolium*, iii. 377.
Dipholis salicifolia, ii. 298, 299.
DIPHYSA, i. 260.
Diphysa carthagenensis, i. 260.
—— floribunda, i. 260.
—— humilis, i. 260.
—— robinioides, i. 261.
—— sennoides, i. 261.
DIPLACHNE, iii. 569.
Diplachne dubia, iii. 569.
—— fascicularis, iii. 569.
—— patens, iii. 570.
—— *procera*, iii. 582.
—— *tolucensis*, iii. 582.
Diplacus rugosus, ii. 448.
Dipladenia harrisii, ii. 314.
DIPLANDRA, i. 466.
Diplandra lopezioides, i. 466.
Diplazium actuale, iii. 639.
—— *acuminatum*, iii. 637.
—— *amplum*, iii. 632.
—— anisophyllum, iii. 630.
—— *anthraxacolepis*, iii. 639.
—— arboreum, iii. 630.
—— callipteris, iii. 631.
—— *callipteris*, iii. 631.
—— *camptocarpon*, iii. 630.
—— costale, iii. 632.
—— crenulatum, iii. 632.
—— *crenulatum*, iii. 632.
—— *expansum*, iii. 632.
—— *feei*, iii. 638.
—— *franconis*, iii. 634.
—— grandifolium, iii. 634.
—— harrisoni, iii. 635.
—— *inæquilaterum*, iii. 639.
—— lindbergii, iii. 635.
—— *lonchophyllum*, iii. 639.
—— macrotis, iii. 626.
—— plantagineum, iii. 637.
—— *plantagineum*, iii. 637.
—— radicans, iii. 637.
—— shepherdi, iii. 639.
—— *shepherdi*, iii. 639.
—— sylvaticum, iii. 640.
—— *ternatum*, iii. 640.
Diplocalyx, ii. 488.
—— *pallidus*, ii. 489.
—— *tomentellus*, ii. 489.
Diplocoma villosa, ii. 113.
Diplopappus ericoides, ii. 121.
—— *graminifolius*, ii. 114.
—— *incanus*, ii. 121.
Diploptychia, i. 441.
Diploptychia aristata, i. 437.
—— ixodes, i. 441.
—— nudicostata, i. 444.
Diploscyphus mexicanus, iii. 470.
Diplostelma, ii. 118.
—— *bellioides*, ii. 118.
Diplostephium moranense, ii. 122.
Diplothrix acerosa, ii. 152.
—— *juniperifolia*, ii. 153.
Dipsaceæ, ii. 69; iv. 182.
Dipsacozamia, iii. 192.
—— *mexicana*, iii. 192.
Dipteracanthus angustus, ii. 504.
—— *geminiflorus*, ii. 505.
—— *hænkei*, ii. 503.
—— *hirsuto-glandulosus*, ii. 505.
—— *hookerianus*, ii. 505.
—— *humifusus*, ii. 505.
—— *humilis*, ii. 505.
—— *hygrophiloides*, ii. 505.
—— *lanato-viscosus*, ii. 506.
—— *leucanthus*, ii. 505, 507.
—— *linearis*, ii. 503.
—— *longepetiolatus*, ii. 506.
—— *macrophyllus*, ii. 506.
—— *paniculatus*, ii. 506.
—— *parviflorus*, ii. 506.
—— *patulus*, ii. 504.
—— *pilosus*, ii. 506.
—— *procumbens*, ii. 507.
—— *rubicaulis*, ii. 507.
—— *schlechtendalianus*, ii. 507.
—— *subcapitatus*, ii. 507.
—— *tubiflorus*, ii. 505, 507.
Dipterocarpeæ, iv. 174.
DIPTERYX, i. 320.
Dipteryx oleifera, i. 320.
Disakisperma mexicana, iii. 588.
Discanthera dissecta, i. 489.
DISCIFLORÆ, i. 142.
Discocarpus mexicanus, iii. 155.
—— *nicaraguensis*, iii. 155.
Discostegia, iii. 696.
Disgrega mexicana, iii. 392.
Disisocactus biformis, i. 547.
Disocactus biformis, i. 547.
Disporopsis, iii. 367.
DISSANTHELIUM, iii. 572.
Dissanthelium, iv. 280.
Dissanthelium sclerochloides, iii. 572.
DISTASIS, ii. 118.
Distasis heterophylla, ii. 119.
—— modesta, ii. 118; iv. 52.
Distemma hahnii, i. 477.
Disterigma pachyphyllum, ii. 275.
DISTICHLIS, iii. 578.
Distichlis, iv. 234.
Distichlis condensata, iii. 578.
—— prostrata, iii. 578.
—— thalassica, iii. 579.
—— *thalassica*, iv. 280.
Distreptus spicatus, ii. 76.
Ditaxis castaneæfolia, iii. 120.
—— *heterantha*, iii. 119.
Dithyra wislizeni, i. 40.
—— wislizenii, iv. 141.
Diuroglossum, i. 133.
DODECATHEON, ii. 288.
Dodecatheon, iv. 67, 229.
Dodecatheon meadia, ii. 288.
DODONÆA, i. 215.
Dodonæa bialata, i. 215.
—— schiedeana, i. 215.
—— viscosa, i. 215.
DODONEÆ, i. 215.
Dolichos altissimus, i. 300.
—— *mexicanus*, i. 309.
—— *palmatilobus*, i. 310.
—— *urens*, i. 300.
DOLIOCARPUS, i. 12.
Doliocarpus pubens, i. 12.
—— *semidentatus*, i. 12.
DOMBEYEÆ, i. 129.
Donax arundinaceus, iii. 571.
Doodia, iii. 627.
Dorcapteris cervina, iii. 684.
Doronicum mexicanum, ii. 113.
DORSTENIA, iii. 142.
Dorstenia, iii. 140.
Dorstenia contrayerva, iii. 142.
—— drakena, iii. 143.
—— excentrica, iii. 143.
—— *houstoni*, iii. 142, 143.
—— lindeniana, iii. 143.
—— maculata, iii. 143.
—— *mexicana*, iii. 143.
Doryopteris palmata, iii. 624.
Doxantha acutistipula, ii. 490.
—— *lanuginosa*, ii. 491.
—— *mexicana*, ii. 492.
—— *unguis*, ii. 492.
DRABA, i. 33.
Draba, iv. 151.
Draba jorullensis, i. 33.
—— micrantha, i. 33.
—— myosotidoides, i. 33.
—— *myosotidoides*, iv. 282.
—— popocatepetlensis, i. 34.
—— *popocatepetlensis*, iv. 283.
—— tolucensis, i. 34.

Draba toluccensis, iv. 150, 283.
—— unilateralis, iv. 6.
—— vulcanica, i. 34.
Dracæna, iv. 274.
—— *parviflora*, iii. 372.
DRACENEÆ, iii. 369.
DRACOCEPHALUM, ii. 567.
Dracocephalum mexicanum, ii. 568; iv. 148.
—— parviflorum, ii. 567.
—— *speciosum*, ii. 570.
—— *variegatum*, ii. 570.
—— *virginianum*, ii. 570.
DRACONTIUM, iii. 427.
Dracontium gigas, iii. 427.
—— *gigas*, iv. 278.
—— *pertusum*, iii. 427.
—— *repens*, iii. 434.
—— *scandens*, iii. 434.
Drejera greggii, ii. 522.
—— *juncea*, ii. 522.
—— *puberula*, ii. 523.
—— *thurberi*, ii. 523.
—— *virgata*, ii. 522.
—— *willdenowiana*, ii. 521.
—— *wrightii*, ii. 523.
DREPANOCARPUS, i. 315.
Drepanocarpus, iv. 230.
—— cyathiformis, i. 315.
—— *inundatus*, i. 316.
—— lunatus, i. 315.
—— *lunatus*, iv. 230.
—— microphyllus, i. 316.
—— mucronulatus, i. 315.
Drepanospron polymorphum, iv. 31.
—— scabrellum, iv. 31.
DRIMYS, i. 14.
Drimys, iv. 314, 234.
Drimys granatensis, i. 14.
—— mexicana, i. 14.
—— sylvatica, i. 14.
DROSERACEÆ, iv. 179.
Droseraceæ, i. 399.
DRYMARIA, i. 73.
Drymaria, i. 68; iv. 147, 236.
Drymaria arenarioides, i. 73.
—— cordata, i. 73.
—— *cordata*, i. 76; iv. 11.
—— crassifolia, iv. 11.
—— effusa, i. 73.
—— fendleri, iv. 11.
—— *frankenioides*, i. 73.
—— glandulosa, i. 73; iv. 11.
—— *glandulosa*, i. 76.
—— gracilis, i. 73.
—— gracillima, i. 74.
—— grandiflora, i. 73.
Drymaria hirsuta, i. 73.
—— laxiflora, i. 74.
—— leptoclados, i. 74.
—— nodosa, i. 74.
—— palmeri, i. 74.
—— palustris, i. 75.
—— *palustris*, iv. 11.
—— pauciflora, i. 75.
—— pilosa, i. 73.
—— *pilosa*, i. 76.
—— polycarpoides, i. 75; iv. 11.
—— ramosissima, i. 75.
—— *ramosissima*, iv. 11.
—— suffruticosa, iv. 11.
—— villosa, i. 75; iv. 11.
—— xerophylla, i. 75.
Drymoglossum, iii. 672.
—— *lanceolatum*, iii. 682.
DRYMONIA, ii. 483.
Drymonia alloplectoides, ii. 483.
—— conchocalyx, ii. 483.
—— mollis, ii. 483.
—— mucronulosa, ii. 483.
—— ovata, ii. 483.
—— parviflora, ii. 483.
—— *punctata*, ii. 483.
—— spectabilis, ii. 483.
—— turrialvæ, ii. 483.
—— warscewicziana, ii. 483.
Drynaria angusta, iii. 654.
—— *araneosa*, iii. 655.
—— *cordifolia*, iii. 643.
—— *crassinervata*, iii. 661.
—— *elongata*, iii. 677.
—— *fulva*, iii. 655.
—— *lepidota*, iii. 661.
—— *lycopodioides*, iii. 663.
—— *mexicana*, iii. 661.
—— *prieurii*, iii. 677.
—— *stenoloma*, iii. 654, 669.
—— *torulosa*, iii. 654.
—— *vestita*, iii. 661.
DRYOPETALON, i. 30.
Dryopetalon runcinatum, i. 30.
Duchassaingia glauca, i. 298.
Duhamelia, ii. 34.
—— *patens*, ii. 34.
Dulongia acuminata, i. 385.
—— *integerrima*, i. 385.
—— *laticuspis*, i. 385.
Dumerilia alamani, ii. 255; iv. 64.
—— *humboldtii*, ii. 256; iv. 65.
DUNALIA, ii. 424.
Dunalia ramiflora, ii. 425.
Dunantia achyranthes, ii. 167.
DURANTA, ii. 537.
Duranta ellisia, ii. 537.
Duranta inermis, ii. 537.
—— *jalapensis*, iv. 302.
—— plumieri, ii. 537; iv. 107.
—— *plumieri*, iv. 166.
—— *spinosa*, ii. 537.
—— *xalapensis*, ii. 537.
Dysmicodon perfoliatum, ii. 271.
DYSODIA, ii. 218.
Dysodia acerosa, ii. 220.
—— appendiculata, ii. 219; iv. 60, 61.
—— chrysanthemoides, ii. 219.
—— *chrysanthemoides*, iv. 61.
—— *fastigiata*, ii. 219.
—— *glandulosa*, ii. 219.
—— grandiflora, ii. 219; iv. 60.
—— *incana*, ii. 219.
—— *integerrima*, ii. 219.
—— integrifolia, iv. 61.
—— *montana*, iv. 60.
—— pubescens, ii. 219; iv. 61.
—— *serratifolia*, ii. 221.
—— squamosa, iv. 61.
—— tagetiflora, iv. 61.
—— *tagetiflora*, ii. 219.
Dysodium divaricatum, ii. 145.
Dyssodia, ii. 218.
—— *porophyllum*, ii. 218.

EBENACEÆ, iii. 299; iv. 67.
Ebenaceæ, iv. 186, 204.
ECASTAPHYLLUM, i. 314.
Ecastaphyllum, iv. 230.
—— brownei, i. 314; iv. 112.
—— *brownei*, iv. 230.
—— *molle*, i. 314.
ECHEANDIA, iii. 375.
Echeandia albiflora, iii. 376.
—— *graminea*, iii. 375.
—— *hænkeana*, iii. 376.
—— *leptophylla*, iii. 375.
—— *leucantha*, iii. 376.
—— parviflora, iv. 91.
—— terniflora, iii. 376.
Echeandra terniflora, iv. 295.
—— ——, var. *angustifolia*, iii. 375.
Echeveria, i. 387; iv. 120, 149, 241, 262.
—— *acutifolia*, i. 387.
—— *agavoides*, i. 387.
—— albiflora, i. 388.
—— *bifida*, i. 388.
—— *cæspitosa*, i. 389.
—— *campanulata*, i. 389.
—— *canaliculata*, i. 389.
—— *cymosa*, i. 389.

Echeveria fulgens, i. 389.
—— *grandiflora*, i. 390.
—— *linguæfolia*, i. 390.
—— *lurida*, i. 390.
—— *mucronata*, i. 391; iv. 149.
—— *paniculata*, i. 390.
—— parviflora, i. 391.
—— *pubescens*, i. 391.
—— *pumila*, i. 391.
—— *racemosa*, i. 390.
—— *retusa*, i. 392.
—— *rosacea*, i. 392.
—— *rosea*, i. 392.
—— *scheerii*, i. 392.
—— *secunda*, i. 392.
—— *strictiflora*, i. 392.
—— *teretifolia*, i. 392.
ECHIDIOCARYA, ii. 379.
Echidiocarya arizonica, ii. 379.
Echinacea heterophylla, ii. 168.
Echinanthus, iii. 495.
ECHINOCACTEÆ, i. 501.
ECHINOCACTUS, i. 528.
Echinocactus, iv. 141, 144, 212.
Echinocactus acifer, i. 528.
—— acroacanthus, i. 528.
—— *acutangulus*, i. 530.
—— adversipinus, i. 528.
—— albatus, i. 528.
—— allardtianus, i. 528.
—— anfractuosus, i. 529.
—— arachnoideus, i. 529.
—— *armatus*, i. 502.
—— arrigens, i. 529.
—— aulacogonus, i. 529.
—— bicolor, i. 529; iv. 44.
—— brachycentrus, i. 529.
—— *cæspititius*, i. 533.
—— *campylacanthus*, i. 534.
—— cereiformis, i. 529.
—— chlorophthalmus, i. 529.
—— concinnus, i. 529.
—— conothelos, i. 529.
—— coptogonus, i. 529.
—— cornigerus, i. 529.
—— *cornigerus*, i. 533.
—— corynodes, i. 529.
—— *courantianus*, i. 538.
—— crispatus, i. 530.
—— curvispinus, i. 532.
—— debilispinus, i. 530.
—— dichroacanthus, i. 530.
—— *dolichacanthus*, i. 530.
—— echidne, i. 530.
—— *echidne*, i. 531.
—— ehrenbergii, i. 530.
—— electrocanthus, i. 530.
Echinocactus elliptica, i. 537.
—— emoryi, i. 530.
—— ensiferus, i. 530.
—— *equitans*, i. 532.
—— exsculptus, i. 530.
—— eyriesii, i. 530.
—— flavispinus, i. 531.
—— flavovirens, i. 531.
—— flexispinus, i. 531.
—— forsterii, i. 531.
—— fossulatus, i. 531.
—— *fossulatus*, i. 532.
—— galeottii, i. 351.
—— ghiesbreghtianus, i. 531.
—— ghiesbreghtii, i. 531.
—— gibbosus, i. 531.
—— gilvus, i. 531.
—— gladiatus, i. 531.
—— glaucescens, i. 531.
—— *glaucus*, i. 537.
—— grandicornis, i. 532.
—— hæmatochroanthus, i. 532.
—— helophorus, i. 532.
—— heteracanthus, 532.
—— hexacanthus, i. 532.
—— hexædrophorus, i. 532.
—— *hexædrophorus*, i. 531.
—— hexædrus, i. 532.
—— heyderi, i. 532.
—— *holopterus*, i. 535.
—— hookeri, i. 532.
—— horizonthalionis, i. 532; iv. 44.
—— horridus, i. 530.
—— horripilus, i. 533.
—— hystricacanthus, i. 532.
—— *hystricacanthus*, i. 540.
—— hystrichodes, i. 533.
—— hystrix, i. 532.
—— ingens, i. 533.
—— insculptus, i. 533.
—— *insculptus*, i. 531.
—— *interruptus*, i. 529.
—— intertextus, i. 533.
—— irroratus, i. 533.
—— karwinskii, i. 533.
—— *karwinskii*, i. 536.
—— lamellosus, 533.
—— lancifer, i. 533.
—— latispinus, ii. 533.
—— lecontei, i. 533.
—— leucanthus, i. 534.
—— *lindheimeri*, i. 538.
—— linkeanus, i. 534.
—— linkii, i. 534.
—— longehamatus, i. 534; iv. 44.
—— lophothele, i. 534.
Echinocactus macleanii, i. 534.
—— macracanthus, i. 534.
—— macrocephalus, i. 534.
—— macrodiscus, i. 534.
—— *macrodiscus*, iv. 286.
—— *mamillarioides*, i. 536.
—— *melmsianus*, i. 539.
—— melocactiformis, i. 534.
—— *mirbelii*, i. 535.
—— monstrosa, i. 537.
—— mühlenpfordtii, i. 534.
—— multiflorus, i. 534.
—— myriostigma, i. 535.
—— nodosus, i. 535.
—— obvallatus, i. 535.
—— *obvallatus*, i. 533.
—— ——, var. *spinosior*, i. 533.
—— octacanthus, i. 535.
—— oligacanthus, i. 535.
—— ornatus, i. 535.
—— *orthacanthus*, i. 531.
—— ottonis, i. 535.
—— *ottonis*, i. 538.
—— oxypterus, i. 535.
—— *oxypterus*, i. 532.
—— pachycornis, i. 535.
—— parryi, i. 535.
—— *pectinatus*, i. 544.
—— pectiniferus, i. 536.
—— *pectiniferus*, i. 544.
—— pentacanthus, i. 535.
—— pentlandii, i. 535.
—— pfeifferi, i. 536.
—— phyllacanthus, i. 536.
—— *phyllantoides*, i. 536.
—— *piliferus*, i. 536.
—— pilosus, i. 536; iv. 44.
—— platyacanthus, i. 536.
—— platyceras, i. 536.
—— *platyceras*, i. 533.
—— *polycentrus*, i. 531.
—— polycephalus, i. 536.
—— porrectus, i. 536.
—— pottsii, i. 536.
—— prolifera, i. 537.
—— pruinosus, i. 536.
—— pseudo-cereus, i. 537.
—— *pulchellus*, i. 545.
—— quadrinatus, i. 537.
—— *quadrinatus*, i. 539.
—— recurvus, i. 537.
—— reichenbachii, i. 537.
—— rhodophthalmus, i. 537.
—— robustus, i. 537.
—— *robustus*, i. 538.
—— scheerii, i. 537.
—— *scheerii*, i. 540.

Echinocactus sclerothrix, i. 537.
—— setosus, i. 537.
—— sinuatus, i. 537.
—— smithii, i. 537.
—— solenacanthus, i. 537.
—— sphærocephalus, i. 538.
—— spina-christi, i. 538.
—— *spina-christi*, i. 502.
—— *spinosus*, i. 528.
—— spiralis, i. 538.
—— *stellaris*, i. 538.
—— *subgibbosus*, i. 530.
—— *subporrectus*, i. 534.
—— subuliferus, i. 538.
—— sulphureus, i. 538.
—— tenuispinus, i. 538.
—— tetracentrus, i. 538.
—— texensis, i. 538.
—— *theiacanthus*, i. 536.
—— *theionacanthus*, i. 536.
—— theloides, i. 538.
—— thrincogonus, i. 538.
—— *tortus*, i. 535.
—— tribolacanthus, i. 538.
—— tricuspidatus, i. 539.
—— tuberculatus, i. 539.
—— *tuberosus*, i. 534.
—— tubiflorus, i. 539.
—— turbiniformis, i. 539.
—— uncinatus, i. 539.
—— undulatus, i. 539.
—— *undulatus*, i. 531.
—— *unguispinus*, i. 533.
—— vanderæyi, i. 539.
—— *vanderæyi*, i. 530.
—— vargasii, i. 539.
—— visnaga, i. 539.
—— wegenerii, i. 539.
—— *wegenerii*, i. 537.
—— williamsii, i. 539.
—— *wippermannii*, i. 528.
—— wislizenii, i. 539.
—— *wislizenii*, iv. 142.
—— *xiphacanthus*, i. 529.
Echinocereus, i. 545, 547.
Echinocereus salmdyckianus, i. 545.
—— similis, i. 546.
—— subinermis, i. 546.
Echinochloa, iii. 500, 501.
ECHINOCYSTIS, i. 486.
Echinocystis coulteri, i. 487.
—— floribunda, i. 487.
—— gemella, i. 487.
—— glutinosa, i. 487.
—— lanata, i. 487.
—— longispina, i. 487.
—— milleflora, i. 487.
Echinocystis paniculata, i. 487.
—— *pedata*, i. 489.
—— pubescens, i. 487.
—— torquata, i. 487.
—— wrightii, i. 487.
ECHINODORUS, iii. 439.
Echinodorus, iv. 231.
Echinodorus bracteatus, iii. 439.
—— ellipticus, iii. 439.
—— *guyanensis*, iii. 438.
—— macrophyllus, iii. 439.
—— *muricatus*, iii. 439.
—— *parvulus*, iii. 437.
—— radicans, iii. 439.
—— *subulatus*, iii. 438.
—— *tenellus*, iii. 438.
—— virgatus, iii. 439.
Echinolæna polystachya, iii. 497.
Echinopepon horridus, i. 487.
—— *milleflorus*, i. 487.
—— *quinquelobatus*, i. 487.
Echinopsis pectinata, i. 544.
ECHINOPTERYS, i. 149.
Echinopterys lappula, i. 149.
ECHINOSPERMUM, ii. 377.
Echinospermum mexicanum, ii. 377.
—— *mexicanum*, iv. 291.
ECHITES, ii. 314.
Echites aspera, ii. 314.
—— *bignoniæflora*, ii. 310.
—— billbergii, ii. 314.
—— *brachysiphon*, ii. 315.
—— *cinerea*, ii. 313.
—— *convolvulacea*, ii. 316.
—— cordata, ii. 314.
—— coulteri, iv. 68.
—— *difformis*, ii. 313.
—— *glaucescens*, ii. 317.
—— *hirsuta*, ii. 316.
—— *hirtella*, ii. 316.
—— *hispida*, ii. 316.
—— *hypoleuca*, ii. 315.
—— jasminiflora, ii. 314.
—— *karwinskii*, ii. 316.
—— lanata, ii. 314.
—— *lanuginosa*, ii. 316.
—— *lasiocarpa*, ii. 316.
—— *macrosiphon*, ii. 315.
—— mexicana, ii. 314.
—— microcalyx, ii. 314.
—— *oaxacana*, ii. 316.
—— paludosa, iv. 113.
—— pandurata, ii. 314.
—— portobellensis, ii. 314.
—— rosea, ii. 315.
—— secundiflora, ii. 315.
—— *spicata*, ii. 312.
Echites suaveolens, ii. 315.
—— *torosa*, ii. 315.
—— torulosa, ii. 315.
—— trifida, ii. 315.
—— tubiflora, ii. 315.
—— umbellata, ii. 315.
—— *veraguensis*, ii. 317; iv. 167.
Echthronema convoluta, iii. 330.
—— *tenuifolia*, iii. 331.
ECLIPTA, ii. 158.
Eclipta brachypoda, ii. 158.
—— erecta, ii. 158; iv. 112.
—— *humilis*, ii. 160.
Eddya hispidissima, ii. 371.
—— mexicana, iv. 71.
EGLETES, ii. 117.
Egletes humilis, ii. 117.
—— liebmanni, ii. 117.
—— obovata, ii. 117.
—— *ramosissima*, ii. 118.
—— viscosa, ii. 117.
EHRETIA, ii. 370.
Ehretia andrieuxii, ii. 369.
—— ciliata, ii. 370.
—— elliptica, ii. 370.
—— *exasperata*, ii. 370.
—— *formosa*, ii. 369.
—— *guatemalensis*, ii. 370.
—— latifolia, ii. 370.
—— longifolia, ii. 370.
—— *oaxacana*, ii. 369.
—— *revoluta*, ii. 370.
—— scabra, ii. 371.
—— *scabra*, ii. 370.
—— tinifolia, ii. 371.
—— *tinifolia*, ii. 370.
Ehrharta, iii. 531.
EICHORNIA, iii. 384.
Eichornia, iv. 231.
Eichornia azurea, iii. 384.
Einomera berlandieri, iii. 43.
—— *brevipes*, iii. 41.
—— subclausum, iv. 84.
ELÆAGIA, ii. 25.
Elæagia auriculata, ii. 25.
Elæagnaceæ, iii. 79; iv. 192, 226.
ELÆIS, iii. 415.
Elæis, iv. 231, 275, 276.
Elæis melanococca, iii. 415.
Elæodendron ——?, iv. 111.
Elaphoglossum, iii. 683.
—— *cognatum*, iii. 690.
—— *conforme*, *β. angustatum*, iii. 684.
—— glaucum, iii. 685.
—— guatemalense, iii. 685.
—— *hartwegii*, iii. 687.

Elaphoglossum longifolium, iii. 686.
—— *revolutum*, iii. 690.
—— salvini, iii. 688.
ELAPHRIUM, i. 178.
Elaphrium, i. 177.
Elaphrium aloexylon, i. 178.
—— *aloexylon*, iv. 20.
—— ariense, i. 178.
—— *ariense*, iv. 21.
—— bicolor, i. 178.
—— *bicolor*, iv. 20.
—— *bipinnatum*, iv. 19.
—— copalliferum, i. 179.
—— *copalliferum*, iv. 21.
—— crenatum, i. 179.
—— *cuneatum*, iv. 20.
—— excelsum, i. 179.
—— *excelsum*, iv. 20.
—— fagaroides, i. 179.
—— *fagaroides*, iv. 19.
—— glabrifolium, i. 179.
—— *glabrifolium*, iv. 20.
—— grandifolium, i. 179.
—— *grandifolium*, iv. 19.
—— graveolens, i. 179.
—— *graveolens*, iv. 19.
—— *integrifolium*, iv. 18.
—— jorullense, i. 179.
—— *jorullense*, iv. 20.
—— lancifolium, i. 179.
—— *lancifolium*, iv. 18.
—— lanuginosum, i. 179.
—— *lanuginosum*, iv. 20.
—— ovalifolium, i. 179.
—— *ovalifolium*, iv. 18.
—— penicillatum, i. 179.
—— *penicillatum*, iv. 20.
—— pubescens, i. 179.
—— simplicifolium, i. 180.
—— *simplicifolium*, iv. 18.
—— *tatamaco*, iv. 19.
—— torulosum, i. 180.
ELATERIEÆ, i. 486.
ELATERIUM, i. 488.
Elaterium biflorum, i. 490.
—— *brachystachyum*, i. 489.
—— carthaginense, i. 488.
—— ciliatum, i. 488.
—— *cordatum*, iv. 233.
—— *coulteri*, i. 487.
—— filiforme, i. 488.
—— *floribundum*, iv. 303.
—— *gemellum*, i. 487.
—— gracile, i. 488.
—— *hastatum*, i. 489.
—— longiflorum, i. 488.
—— *pubescens*, i. 487.
Elaterium quadrifidum, i. 488.
—— *quinquefidum*, i. 483.
—— *rubiflorum*, i. 490.
—— *tamnoides*, i. 490.
—— *torquatum*, i. 487.
—— trilobatum, iv. 41.
—— *wrightii*, i. 487.
Elatinaceæ, iv. 205.
ELATINE, iv. 12.
Elatine americana, iv. 12.
—— *americana*, i. 81.
ELATINEÆ, iv. 12.
Elatineæ, i. 81; iv. 174, 216, 224.
Electra galeottii, ii. 195.
—— *mexicana*, ii. 196.
Eleocharis, iii. 454.
Eleogenus capitatus, iii. 455.
—— *nodulosus*, iii. 456.
ELEPHANTOPUS, ii. 76.
Elephantopus angustifolius, ii. 76; iv. 49.
—— *carolinianus*, ii. 76.
—— cuneifolius, iv. 49.
—— *martii*, ii. 76.
—— *mollis*, ii. 76.
—— scaber, ii. 76.
—— spicatus, ii. 76.
—— *tomentosus*, ii. 76.
Elephantosis angustifolia, ii. 76.
ELEUSINE, iii. 565.
Eleusine ægyptiaca, iii. 565; iv. 114.
—— *gouini*, iii. 565.
—— inæqualis, iii. 565.
—— indica, iii. 565; iv. 109, 114.
—— *mucronata*, iii. 565.
—— *rigidifolia*, iii. 565.
—— *scabra*, iii. 565.
—— *virgata*, iii. 566.
ELEUTHERANTHERA, ii. 171.
Eleutheranthera ovata, ii. 171.
Eleutherine plicata, iii. 328.
Eleutheropetalum ernesti-augusti, iii. 404.
—— *sartorii*, iii. 406.
Elichrysum lavandulæfolium, ii. 134.
ELIONURUS, iii. 520.
Elionurus candidus, iii. 520.
—— ciliaris, iii. 520.
—— *ciliaris*, iv. 301.
—— tripsacoides, iii. 521.
—— *tripsacoides*, iii. 520.
ELLEANTHUS, iii. 217.
Elleanthus capitatus, iii. 217.
—— *capitatus*, iii. 218.
—— hymenophorus, iii. 217.
—— *linifolius*, iii. 217.
Ellimia ruderalis, i. 46.
ELLISIA, ii. 358.
Ellisia chrysanthemifolia, ii. 358.
Ellisiophyllum, iv. 255.
Elodea canadensis, iii. 196.
ELVIRA, ii. 141.
Elvira, iv. 233.
Elvira biflora, ii. 141.
ELYMUS, iii. 585.
Elymus, iv. 148.
Elymus mexicanus, iii. 585.
—— *sabulosus*, iii. 585.
—— sitanion, iii. 585.
—— *sitanion*, iv. 279.
—— virginicus, iii. 586.
ELYTRARIA, ii. 500.
Elytraria apargiæfolia, ii. 501.
—— *bromoides*, ii. 501; iv. 79.
—— *caulescens*, ii. 501.
—— *fasciculata*, ii. 501.
—— *frondosa*, ii. 501.
—— *microstachya*, ii. 501.
—— *pachystachya*, ii. 501.
—— *ramosa*, ii. 501.
—— tridentata, ii. 501; iv. 79.
Emilia sonchifolia, ii. 235.
Emmenanthe, ii. 360.
Emorya, iv. 142.
Empetraceæ, iii. 181; iv. 194.
Empetrum nigrum, iii. 181.
Enantiocuphea panamensis, i. 444.
ENCELIA, ii. 183.
Encelia albescens, ii. 183.
—— amplexicaulis, ii. 183.
—— *amplexicaulis*, iv. 57.
—— cordata, ii. 183.
—— *cordata*, iv. 57.
—— exaristata, ii. 183.
—— *farinosa*, iv. 142.
—— fœtida, ii. 183.
—— *fœtida*, iv. 57.
—— *ghiesbreghtiana*, iv. 57.
—— ghiesbreghtii, ii. 184.
—— grandiflora, ii. 184.
—— halimifolia, ii. 184; iv. 57.
—— heterophylla, ii. 184.
—— hispida, ii. 184.
—— lagascæformis, ii. 184.
—— mexicana, ii. 184; iv. 57.
—— microphylla, ii. 184.
—— polycephala, ii. 184.
—— sanguinea, ii. 185.
—— sericea, ii. 185; iv. 57.
—— subaristata, ii. 185; iv. 57.
Encephalartos latifolius, iii. 194.
Enckea californica, iii. 56.
—— *ceanothifolia*, iii. 47.

Enckea decrescens, iii. 48.
—— *discolor*, iii. 46.
—— *glaucescens*, iii. 56.
—— *kunthii*, iii. 49.
—— lindenii, iii. 50.
—— *plantaginea*, iii. 51.
—— *platyphylla*, iii. 53.
—— *reticulata*, iii. 54.
—— *schlechtendalii*, iii. 55.
—— *smilacifolia*, iii. 55.
—— *stipulacea*, iii. 55.
—— *swartzii*, iii. 51.
—— *unguiculata*, iii. 56.
—— *variifolia*, iii. 57.
ENGELHARDTIA, iii. 164.
Engelhardtia, iv. 229.
Engelhardtia oreomunnea, iii. 164.
ENGELMANNIA, ii. 148.
Engelmannia pinnatifida, ii. 148.
ENSLENIA, ii. 328.
Enslenia, iv. 254.
Enslenia ligulata, ii. 328.
ENTADA, i. 343.
Entada gigalobium, i. 343.
—— polystachya, i. 343; iv. 32.
—— *pursætha*, i. 343.
—— scandens, i. 343.
ENTEROLOBIUM, i. 361.
Enterolobium cyclocarpum, i. 361.
—— schomburgkii, i. 361.
—— *schomburgkii*, iv. 163.
Epacrideæ, ii. 285; iv. 185.
EPALTES, ii. 134.
Epaltes mexicana, ii. 134.
EPHEDRA, iii. 182.
Ephedra, iv. 88, 141.
Ephedra antisyphilitica, iii. 182.
—— aspera, iv. 88.
—— pedunculata, iv. 88.
Ephemerum bicolor, iii. 396.
Ephippiorhynchium polycephalum, iii. 466.
EPICAMPES, iii. 548.
Epicampes, iii. 550.
Epicampes berlandieri, iii. 548.
—— bourgæi, iii. 548.
—— buchingeri, iii. 548.
—— expansa, iii. 548.
—— gigantea, iii. 548.
—— lanata, iii. 549.
—— *lanata*, iv. 296.
—— laxiuscula, iii. 549.
—— macroura, iii. 549.
—— *macroura*, iv. 296.
—— mutica, iii. 549.
—— *mutica*, iii. 548.
—— pubescens, iii. 549.
Epicampes rigens, iii. 549.
—— *rigens*, iv. 279.
—— *robusta*, iii. 550.
—— stricta, iii. 550.
EPIDENDREÆ, iii. 197.
Epidendreæ, iv. 195.
EPIDENDRUM, iii. 224.
Epidendrum, iii. 221; iv. 148, 152, 153, 212, 233, 268, 271.
Epidendrum aciculare, iii. 224.
—— adenocarpum, iii. 224.
—— adenocaulon, iii. 224.
—— *æmulum*, iii. 231.
—— affine, iii. 224.
—— *affine*, iii. 236.
—— *agathosmicum*, iii. 229.
—— alatum, iii. 224.
—— *alatum*, iii. 225, 241.
—— *aloifolium*, iii. 230, 236.
—— *altissimum*, iii. 278.
—— amabile, iii. 225.
—— ambiguum, iii. 225.
—— anceps, iii. 225.
—— *ancipiticaulon*, iv. 301.
—— anisatum, iii. 225.
—— antenniferum, iii. 225.
—— arbusculum, iii. 225.
—— *arbusculum*, iv. 304.
—— aromaticum, iii. 225.
—— *articulatum*, iii. 241.
—— asperum, iii. 226.
—— atropurpureum, iii. 226.
—— aurantiacum, iii. 226.
—— *aureum*, iii. 226.
—— auritum, iii. 226.
—— barbæ, iii. 226.
—— *basilare*, iii. 240.
—— belizense, iii. 226.
—— *bicornutum*, iv. 152.
—— *bidentatum*, iii. 221.
—— *bigibberosum*, iii. 222.
—— *bilamellatum*, iii. 222.
—— *bisetum*, iii. 237.
—— *boothianum*, iii. 226.
—— brachiatum, iii. 226.
—— *brachiatum*, iii. 231.
—— *bracteolatum*, iii. 238.
—— *bractescens*, iii. 224.
—— brassavolæ, iii. 227.
—— *brassavolæ*, iv. 294.
—— caligarium, iii. 227.
—— *calocheilum*, iii. 224.
—— campylostalix, iii. 227.
—— candollei, iii. 227.
—— *candollei*, iv. 301, 302.
—— carinatum, iii. 227.
—— *carthaginense*, iii. 280.
Epidendrum caudatum, iii. 288.
—— *cebolleta*, iii. 280.
—— centropetalum, iii. 227.
—— *cepiforme*, iii. 227.
—— chiriquense, iii. 227.
—— chloe, iii. 227.
—— *chloranthum*, iii. 227.
—— chloroleucum, iii. 227.
—— *chloroleucum*, iii. 228.
—— ——, var. *fusco-luteum*, iii. 227.
—— chlorops, iii. 228.
—— chondylobolbon, iii. 228.
—— ciliare, iii. 228.
—— *ciliare*, iv. 270.
—— *cinnamomeum*, iii. 238.
—— *citrinum*, iii. 243.
—— clavatum, iii. 228.
—— clowesii, iii. 228.
—— cnemidophorum, iii. 228.
—— cochleatum, iii. 228.
—— *cochleatum*, iv. 269, 270, 303.
—— collare, iii. 229.
—— *colorans*, iii. 237.
—— concolor, iii. 229.
—— coriifolium, iii. 229.
—— costaricense, iii. 229.
—— costatum, iii. 229.
—— *costatum*, iv. 304.
—— criniferum, iii. 229.
—— *crispatum*, iii. 224.
—— *cucullatum*, iii. 245.
—— cuspidatum, iii. 228.
—— *cycnostalix*, iii. 240.
—— delicatissimum, iii. 229.
—— densiflorum, iii. 229.
—— *densiflorum*, iii. 230.
—— difforme, iii. 229.
—— *difforme*, iv. 270.
—— *diffusum*, iii. 218.
—— diotum, iii. 229.
—— *discolor*, iii. 235; iv. 302.
—— distantiflorum, iii. 229.
—— eburneum, iii. 230.
—— *echinocarpon*, iii. 268.
—— elegans, iii. 230.
—— *elongatum*, iii. 239.
—— ensatum, iii. 230.
—— *ensicaulon*, iii. 242.
—— equitans, iii. 230.
—— erubescens, iii. 230.
—— *erubescens*, iv. 294, 304.
—— *esculentum*, iii. 224.
—— exasperatum, iii. 230.
—— falcatum, iii. 230.
—— *falcatum*, iii. 236.
—— favoris, iii. 230.

Epidendrum firmum, iii. 230.
—— flabellatum, iii. 230.
—— flavovirens, iii. 230.
—— floribundum, iii. 230.
—— *floribundum*, iv. 270.
—— *formosum*, iii. 224.
—— fragrans, iii. 231.
—— *fragrans*, iv. 270.
—— fruticosum, iii. 231.
—— *fuchsii*, iii. 240.
—— funckianum, iii. 231.
—— *funiferum*, iii. 237.
—— *fuscatum*, iii. 225; iv. 270.
—— galeottianum, iii. 231.
—— ghiesbreghtianum, iii. 231.
—— *gladiatum*, iii. 225.
—— *glaucum*, iii. 226, 268; iv. 302.
—— glaucum, iii. 231.
—— globosum, iii. 231.
—— glumibracteatum, iii. 231.
—— *grahami*, iii. 237.
—— grandiflorum, iii. 256.
—— *graniticum*, iii. 236.
—— *granulosum*, iii. 244.
—— gratiosum, iii. 231.
—— gravidum, iii. 232.
—— *guatemalense*, iii. 236.
—— guttatum, iii. 232.
—— *guttatum*, iii. 283; iv. 304.
—— hanburii, iii. 232.
—— hastatum, iii. 232.
—— *hügelianum*, iii. 244.
—— imatophyllum, iii. 232.
—— imbricatum, iii. 232.
—— *imbricatum*, iv. 294.
—— incomptum, iii. 232.
—— *incumbens*, iii. 225.
—— *indusiatum*, iii. 232.
—— ionophlebium, iii. 232.
—— *juncifolium*, iii. 280.
—— karwinskii, iii. 232.
—— *labiatum*, iii. 244.
—— lacertinum, iii. 232.
—— *lactiflorum*, iii. 230; iv. 302.
—— lambrocaulon, iii. 232.
—— *lamellatum*, iii. 241.
—— lancifolium, iii. 233.
—— *lansbergii*, iii. 237.
—— latilabre, iii. 233.
—— ledifolium, iii. 233.
—— *ledifolium*, iv. 302, 303, 304.
—— *leiobulbon*, iii. 242.
—— leucomelanum, iii. 233.
—— lignosum, iii. 233.
—— ligulatum, iii. 233.
—— *ligulatum*, iv. 302, 304.
—— limbatum, iii. 233.
Epidendrum lindenianum, iii. 226; iv. 302.
—— lindleyanum, iii. 233.
—— *lineare*, iii. 222.
—— *linearifolium*, iii. 224.
—— *lineatum*, iii. 231; iv. 302.
—— linkianum, iii. 233.
—— *lividum*, iii. 241.
—— *longipetalum*, iii. 224, 225.
—— luteoroseum, iii. 233.
—— macrobotryum, iii. 234.
—— *macrobulbon*, iv. 89.
—— *macrochilum*, iii. 226.
—— *marginatum*, iii. 238.
—— marmoratum, iii. 234.
—— melanocaulon, iii. 234.
—— meliosmum, iii. 234.
—— michuacanum, iii. 234.
—— microbulbon, iii. 234.
—— microcharis, iii. 234.
—— microdendron, iii. 234.
—— *miserum*, iii. 218.
—— *musciferum*, iii. 225.
—— myrianthum, iii. 234.
—— myodes, iii. 234.
—— nævosum, iii. 234.
—— nemorale, iii. 234.
—— nitens, iii. 235.
—— nocturnum, iii. 235.
—— *nocturnum*, iv. 269, 270, 302.
—— *nodosum*, iii. 245.
—— nonchinense, iii. 235.
—— nubium, iii. 235.
—— obtusum, iii. 235.
—— ochraceum, iii. 235.
—— *ochraceum*, iv. 294.
—— *ochranthum*, iii. 242.
—— œrstedii, iii. 235.
—— oncidioides, iii. 235.
—— *ophioglossoides*, iii. 204.
—— *oppositifolium*, iii. 219; iv. 303.
—— ovalifolium, iii. 236.
—— ovulum, iii. 236.
—— pallens, iii. 236.
—— *pallens*, iv. 294.
—— palpigerum, iii. 236.
—— panthera, iii. 236.
—— *papillosum*, iii. 224.
—— paranthicum, iii. 236.
—— parkinsonianum, iii. 236.
—— *parkinsonianum*, iii. 230; iv. 301.
—— pastoris, iii. 236.
—— *pastoris*, iii. 233.
—— patens, iii. 236.
—— pentadactylum, iii. 236.
—— *pentadactylum*, iv. 294.
Epidendrum pergameneum, iii. 237.
—— phœniceum, iii. 237.
—— *phœniceum*, var. *vanillosmum*, iii. 237.
—— phyllocharis, iii. 237.
—— phymatoglossum, iii. 237.
—— physodes, iii. 237.
—— piliferum, iii. 237.
—— *piperinum*, iii. 243.
—— platystigma, iii. 237.
—— polyanthum, iii. 237.
—— polybulbon, iii. 237.
—— *polybulbon*, iv. 302.
—— porpax, iii. 237.
—— porphyreum, iii. 238.
—— pratense, iii. 238.
—— prismatocarpum, iii. 238.
—— propinquum, iii. 238.
—— pruinosum, iii. 238.
—— *pruinosum*, iv. 304.
—— pseudepidendrum, iii. 238.
—— pterocarpum, iii. 238.
—— *pulchellum*, iii. 218; iv. 303, 304.
—— *punctatum*, iii. 249.
—— *puniceum*, iii. 221; iv. 305.
—— *purpurascens*, iii. 228.
—— *pusillum*, iii. 282.
—— *pygmæum*, iii. 218.
—— *quadratum*, iii. 242.
—— radiatum, iii. 238.
—— *radiatum*, iv. 301, 303.
—— radicans, iii. 238.
—— ramonense, iii. 239.
—— ramosum, iii. 239.
—— *ramosum*, iv. 270, 303.
—— raniferum, iii. 239.
—— resectum, iii. 239.
—— *rhizophorum*, iii. 238.
—— rhynchophorum, iii. 239.
—— *rhynchophorum*, iv. 302.
—— rigidum, iii. 239.
—— *rigidum*, iv. 301.
—— *rubro-cinctum*, iii. 229.
—— *ruscifolium*, iii. 201.
—— scriptum, iii. 239.
—— sculptum, iii. 239.
—— secundum, iii. 239.
—— selligerum, iii. 239.
—— seriatum, iii. 240.
—— sisyrinchiifolium, iii. 240.
—— *sisyrinchiifolium*, iv. 304.
—— skinneri, iii. 240.
—— spectabile, iii. 240.
—— *spectabile*, iii. 236.
—— spondiadum, iii. 240.
—— *spruceanum*, iii. 235.
—— squalidum, iii. 240.

Epidendrum stamfordianum, iii. 240.
—— stangeanum, iii. 240.
—— stenopetalum, iii. 241.
—— strophinx, iii. 241.
—— subaquilum, iii. 241.
—— subulatifolium, iii. 241.
—— *subulatifolium*, iv. 304.
—— teres, iii. 241.
—— *teres*, iv. 295.
—— tessellatum, iii. 241.
—— tetraceros, iii. 241.
—— *tetrapetalum*, iii. 286.
—— trachycarpum, iii. 241.
—— trachychilum, iii. 241.
—— *tribuloides*, iii. 202.
—— *trichocarpon*, iii. 269.
—— *tridens*, iii. 235.
—— *tripterum*, iii. 214, 233.
—— tripunctatum, iii. 242.
—— *triste*, iii. 235.
—— turbinatum, iii. 242.
—— turialvæ, iii. 242.
—— *umbellatum*, iii. 229.
—— *undulatum*, iii. 280.
—— *uniflorum*, iii. 218.
—— *utricularioides*, iii. 290.
—— varicosum, iii. 242.
—— *varicosum*, iii. 227; iv. 304, 305.
—— vandifolium, iii. 242.
—— venosum, iii. 242.
—— *verrucosum*, iii. 234.
—— vieji, iii. 242.
—— virens, iii. 242.
—— *virens*, iii. 233.
—— virescens, iii. 225.
—— virgatum, iii. 242.
—— *virgatum*, iv. 304, 305.
—— viridipurpureum, iii. 225.
—— viscidum, iii. 228.
—— *viscidum*, iv. 302, 303.
—— vitellinum, iii. 243.
—— *vitellinum*, iv. 304.
—— volutum, iii. 243.
—— *wagneri*, iii. 242.
—— warscewiczii, iii. 243.
EPIGYNÆ, iii. 308.
Epilepis rudis, ii. 196.
EPILOBIUM, i. 449.
Epilobium, iv. 243.
Epilobium brachycarpum, i. 450.
—— coloratum, i. 450.
—— mexicanum, i. 450.
—— repens, i. 450.
—— *repens*, iv. 149.
EPIPACTIS, iii. 304.
Epipactis americana, iii. 304; iv. 269.
—— gigantea, iii. 304.
Epiphyllum ackermanni, i. 547.
EPISCIA, ii. 482.
Episcia chontalensis, ii. 482.
—— congesta, ii. 482.
—— cupreata, ii. 482.
—— lanceolata, ii. 482.
—— lilacina, ii. 482.
—— punctata, ii. 483.
—— *rosea*, ii. 447; iv. 300.
Epithecia glauca, iii. 231.
EQUISETACEÆ, iii. 698.
Equisetaceæ, iv. 200, 204.
Equisetum, iii. 698; iv. 163.
—— *annuliferum*, iii. 700.
—— bogotense, iii. 699.
—— *debile*, iii. 699.
—— *elongatum*, iii. 699.
—— giganteum, iii. 699.
—— *lævigatum*, iii. 699.
—— mexicanum, iii. 699.
—— *mülleri*, iii. 700.
—— myriochætum, iii. 699.
—— ramosissimum, iii. 699.
—— robustum, iii. 700.
—— schaffneri, iii. 700.
ERAGROSTIS, iii. 572.
Eragrostis, iii. 567, 572.
Eragrostis acutiflora, iii. 572.
—— amœna, iii. 572.
—— capillaris, iii. 573.
—— caudata, iii. 573.
—— ciliaris, iii. 573; iv. 109, 114.
—— *ciliaris*, iv. 165.
—— *cognata*, iii. 575.
—— *domingensis*, iii. 574.
—— excelsa, iii. 573.
—— *fendleriana*, iii. 573.
—— *flavescens*, iii. 575.
—— glumacea, iii. 573.
—— *hirsuta*, iii. 574.
—— limbata, iii. 573.
—— lugens, iii. 573.
—— *lugens*, iii. 574.
—— *major*, iii. 575.
—— maxima, iii. 574.
—— maypurensis, iii. 574.
—— *megistachya*, iii. 575.
—— mexicana, iii. 574.
—— *minor*, iii. 575.
—— montufari, iii. 574.
—— oxylepis, iii. 574.
—— palmeri, iii. 575.
—— *panamensis*, iii. 574.
—— *parvula*, iii. 575.
—— pauciflora, iii. 575.
—— *pauciflora*, iii. 573.
—— pectinacea, iii. 575.
Eragrostis pilosa, iii. 575.
—— *pilosa*, iii. 574.
—— *poæformis*, iii. 575.
—— poæoides, iii. 575.
—— *poæoides*, iii. 573.
—— polytricha, iii. 574.
—— purshii, iii. 575.
—— reptans, iii. 576.
—— *secundiflora*, iii. 576.
—— *simpliciflora*, iii. 576.
—— *tephrosanthos*, iii. 573, 575.
—— *uninervia*, iii. 576.
—— *unionis*, iii. 575.
—— *veræ-crucis*, iii. 574.
—— *virescens*, iii. 576.
—— virletii, iii. 576.
ERANTHEMUM, ii. 511.
Eranthemum alatum, ii. 511.
—— cordatum, ii. 511.
—— cuspidatum, ii. 511.
—— fasciculatum, ii. 511.
—— hispidulum, ii. 511.
—— præcox, ii. 511.
Erasmia floribunda, iii. 60.
ERBLICHIA, i. 475.
Erblichia, iv. 170, 212, 222, 230, 244.
Erblichia odorata, i. 475; iv. 39.
ERECHTHITES, ii. 234.
Erechthites, iv. 234, 252.
Erechthites carduifolia, ii. 234.
—— hieraciifolia, ii. 234.
—— petiolata, ii. 234.
—— runcinata, ii. 234.
—— valerianæfolia, ii. 234.
Ereicotis acerosa, iv. 47.
—— *acerosa*, ii. 31.
—— fasciculata, iv. 47.
Eriachænium, ii. 250.
ERIANTHUS, iii. 520.
Erianthus alopecuroides, iii. 520.
—— *brevibarbis*, iii. 520.
—— *contortus*, iii. 520.
—— saccharoides, iii. 520.
Erica, iv. 212.
ERICACEÆ, ii. 276; iv. 67.
Ericaceæ, i. 98; iv. 185, 203, 225, 234, 254.
Ericala spathacëa, ii. 351.
ERIGERON, ii. 123.
Erigeron, ii. 119; iv. 150, 213, 252.
Erigeron affinis, ii. 123.
—— *apurensis*, ii. 125.
—— arizonicus, iv. 53.
—— bonariensis, ii. 123.
—— canadensis, ii. 123; iv. 103.
—— *cinereus*, ii. 124.
—— delphinifolius, ii. 124.

Erigeron diplopappoides, ii. 124.
—— divergens, ii. 124.
—— dryophyllus, iv. 53.
—— eriophyllus, ii. 124.
—— ervendbergii, ii. 124.
—— *expansus*, ii. 121.
—— gnaphalioides, ii. 124.
—— *jamaicense*, ii. 121.
—— karwinskianus, ii. 124.
—— lemmoni, iv. 53.
—— leucanthifolius, ii. 124.
—— longipes, ii. 124.
—— maximus, ii. 124.
—— mucronatus, ii. 124.
—— palmeri, ii. 125; iv. 53.
—— pubescens, ii. 125; iv. 53.
—— *pumilus*, ii. 120.
—— scaposus, ii. 125.
—— *scaposus*, ii. 124; iv. 288.
—— schiedeanus, ii. 125.
—— subspicatus, ii. 125.
—— tenellus, ii. 125.
—— velutipes, ii. 125.
ERIOCAULEÆ, iii. 442.
Eriocauleæ, iv. 199, 205.
Eriocauli, sp. n.?, iii. 443.
ERIOCAULON, iii. 442.
Eriocaulon benthami, iii. 443.
—— ehrenbergianum, iii. 443.
—— microcephalum, iii. 443.
—— *microcephalum*, iii. 443.
ERIOCHLOA, iii. 480.
—— *acuminata*, iii. 483.
—— *annulata*, iii. 483.
—— *distachya*, iii. 483.
—— *grandiflora*, iii. 483.
—— polystachya, iii. 483.
—— *punctata*, iii. 483.
—— *trichopus*, iii. 483.
—— *villosa*, iii. 483.
Eriochrysis cayennensis, iii. 519.
Eriocoma floribunda, ii. 165.
—— *fragrans*, ii. 166.
ERIODENDRON, i. 125.
Eriodendron æsculifolium, i. 125.
—— *anfractuosum*, i. 125; iv. 166.
—— *caribæum*, i. 125.
—— occidentale, i. 125.
ERIOGONUM, iii. 31.
Eriogonum, iv. 259.
Eriogonum abertianum, iii. 31.
—— alatum, iii. 31.
—— *albertii*, iv. 141.
—— annuum, iii. 31.
—— atrorubens, iii. 31.
Eriogonum cernuum, iii. 32.
—— ciliatum, iii. 32.
—— deflexum, iii. 32.
—— fasciculatum, iii. 32.
—— greggii, iii. 32.
—— *helianthemifolium*, iii. 32.
—— hieracifolium, iii. 32.
—— jamesii, iii. 32; iv. 83.
—— pharnaceoides, iii. 32.
—— polycladon, iii. 32.
—— polyfolium, iii. 32.
—— ramosissimum, iii. 33.
—— rotundifolium, iii. 32.
—— tenellum, iii. 32.
—— thomasii, iii. 33.
—— undulatum, iii. 33.
—— *undulatum*, iv. 259, 293.
—— wrightii, iii. 33.
ERIOPHORUM, iii. 462.
Eriophorum cyperinum, iii. 462.
Eriophyllum stœchadifolium, ii. 212.
—— *trolliifolium*, ii. 212.
ERIOSEMA, i. 312.
Eriosema crinitum, i. 312.
—— diffusum, i. 312.
—— grandiflorum, i. 312.
—— *lancifolium*, i. 313.
—— pulchellum, i. 312.
—— simplicifolium, i. 313.
—— violaceum, i. 313; iv. 31.
ERITHALIS, ii. 44.
Erithalis fruticosa, ii. 44; iv. 112.
—— *odorifera*, ii. 44.
ERITRICHIUM, ii. 378.
Eritrichium, iv. 72, 73.
Eritrichium angustifolium, ii. 378.
—— crassisepalum, ii. 378.
—— *floribundum*, ii. 379.
—— *fulvocanescens*, iv. 72.
—— *heliotropoides*, ii. 379.
—— hispidum, ii. 378.
—— jamesii, ii. 378.
—— micranthum, ii. 378.
—— pusillum, ii. 378.
Ernodea, iv. 110.
Ernodea littoralis, iv. 102, 112.
ERODIUM, i. 161.
Erodium cicutarium, i. 161.
—— moranense, i. 161.
—— moschatum, i. 161.
Eruca sativa, i. 38.
Erucaria, iii. 495.
—— *glabra*, iii. 563.
ERYCINA, iii. 289.
Erycina echinata, iii. 289.
ERYNGIUM, i. 560.
Eryngium, iv. 150, 213, 248.
Eryngium aquaticum, i. 560.
—— *aquaticum*, iv. 45.
—— axilliflorum, i. 560.
—— beecheyanum, i. 560.
—— bonplandii, i. 560.
—— *bonplandii*, iv. 286.
—— bromeliæfolium, i. 560.
—— carlinæ, i. 560; iv. 45.
—— *carlinæ*, iv. 150, 286.
—— cervantesii, i. 560.
—— comosum, i. 560.
—— cymosum, i. 561.
—— *cymosum*, i. 560; iv. 286.
—— deppeanum, i. 561; iv. 45.
—— diffusum, i. 561.
—— fœtidum, i. 561.
—— *fœtidum*, iv. 231.
—— ghiesbreghtii, i. 561.
—— gracile, i. 561.
—— gramineum, i. 561.
—— *hænkei*, i. 562.
—— heterophyllum, i. 561.
—— leavenworthii, i. 561.
—— longifolium, i. 561.
—— longirameum, i. 561.
—— *longirameum*, iv. 286.
—— *microcephalum*, i. 563.
—— monocephalum, i. 561.
—— nasturtiifolium, i. 561; iv. 45.
—— pectinatum, i. 561.
—— *pectinatum*, i. 562.
—— phyteumatos, i. 562.
—— proteæflorum, i. 562.
—— *proteæflorum*, iv. 150, 286.
—— ranunculoides, i. 562.
—— scaposum, i. 562.
—— *scaposum*, iv. 286.
—— schiedeanum, i. 562.
—— serratum, i. 562.
—— stellatum, i. 562.
—— subacaule, i. 562.
—— tenue, i. 562.
—— wrightii, i. 562.
—— *wrightii*, iv. 45.
—— yuccæfolium, iv. 45.
ERYSIMUM, i. 37.
Erysimum asperum, i. 37.
—— macradenium, i. 37.
—— *macradenium*, iv. 283.
—— *mexicanum*, i. 37.
—— tilimi, i. 37.
Erythea, iv. 277.
ERYTHRÆA, ii. 345.
Erythræa, ii. 347; iv. 147, 255.

Erythræa calycosa, ii. 345; iv. 70.
—— *chilensis*, ii. 346.
—— *chironioides*, ii. 346.
—— divaricata, ii. 346.
—— *jorullensis*, ii. 348.
—— macrantha, ii. 346.
—— *macrantha*, var. *major*, ii. 346.
—— madrensis, ii. 346.
—— *mexicana*, ii. 346.
—— pauciflora, ii. 346.
—— *pauciflora*, iv. 290.
—— quitensis, ii. 346.
—— setacea, ii. 346.
—— stricta, ii. 346.
—— tenuifolia, ii. 346.
—— tetramera, ii. 347.
Erythranthus coriaceus, ii. 484.
ERYTHRINA, i. 298.
Erythrina breviflora, i. 298.
—— corallodendron, i. 298.
—— coralloides, i. 298; iv. 30.
—— divaricata, i. 298.
—— glauca, i. 298.
—— horrida, i. 298.
—— leptorhiza, i. 298.
—— longipes, i. 298.
—— *longipes*, i. 299.
—— patens, i. 298.
—— princeps, i. 298.
—— reticulata, i. 298.
—— rosea, ii. 299.
—— rubrinervia, i. 299.
—— setosa, i. 299.
—— velutina, i. 299.
ERYTHROCHITON, i. 166.
Erythrochiton lindeni, i. 166.
Erythrolæna conspicua, ii. 251.
ERYTHROXYLEÆ, i. 144.
ERYTHROXYLON, i. 144.
Erythroxylon amplum, i. 144.
—— *floribundum*, i. 144.
—— macrophyllum, i. 144.
—— mexicanum, i. 144.
—— panamense, i. 145.
—— popayanense, i. 145.
ESCALLONIEÆ, i. 385.
Escheria, ii. 473.
ESCHSCHOLTZIA, i. 27.
Eschscholtzia, iv. 142.
Eschscholtzia douglasii, i. 28.
ESCOBEDIA, ii. 456.
Escobedia lævis, ii. 456; iv. 301.
—— linearis, ii. 456.
—— scabrifolia, ii. 456.
—— *stricta*, ii. 456.
ESENBECKIA, i. 170.
Esenbeckia berlandieri, i. 170.
—— pentaphylla, iv. 111.
Espejoa mexicana, ii. 209.
Euagave americana, iii. 339.
—— lurida, iii. 345.
—— megalacantha, iii. 346.
—— mexicana, iii. 346.
—— scolymus, iii. 349.
—— verschaffeltii, iii. 351.
—— vivipara, iii. 351.
—— wislizeni, iii. 352.
Eualcida pilifera, ii. 222.
Euastragalus oxyrhynchus, i. 265.
—— parvus, i. 266.
Eubactris fusca, iii. 412.
—— horrida, iii. 412.
EUCÆSALPINIEÆ, i. 323.
Euchamædorea bifurcata, iii. 403.
—— bracteata, iii. 403.
—— *elatior*, iii. 404.
—— pacaya, iii. 406.
—— tenella, iii. 407.
EUCHLÆNA, iii. 512.
Euchlæna, iv. 279, 280.
Euchlæna bourgæi, iii. 512.
—— *giovanninii*, iii. 512.
—— luxurians, iii. 512.
—— mexicana, iii. 512.
Eucnemis brevilabris, iii. 249.
Eucnide lobata, i. 472; iv. 140, 142.
Eucodonia ehrenbergii, ii. 475.
Eucryphia, i. 369; iv. 240.
Euechites coulteri, iv. 68.
Eueritrichium-Mysosotidea, iv. 72.
EUGENIA, i. 409.
Eugenia arayan, i. 407.
—— brevipes, i. 410.
—— calycorectoides, i. 410.
—— capuli, i. 410.
—— cartagensis, i. 410.
—— *cartagensis*, iv. 158.
—— caryophyllata, i. 410.
—— colipensis, i. 410.
—— corymbosa, i. 410.
—— costaricensis, i. 410.
—— fieldingii, i. 410.
—— friedrichsthalii, i. 410.
—— irazuensis, i. 410.
—— *irazuensis*, iv. 285.
—— karwinskiana, i. 410.
—— lepidota, i. 410.
—— *lepidota*, iv. 157.
—— leucadendron, i. 411.
—— *leucadendron*, iv. 158.
—— lindeniana, i. 411.
—— longipes, i. 410.
Eugenia macrocarpa, i. 411.
—— macroterantha, i. 410.
—— micrantha, i. 410.
—— œrstediana, i. 411.
—— oreinoma, i. 411.
—— origanoides, i. 411.
—— pauciflora, i. 411.
—— *pimenta*, i. 409.
—— schiedeana, i. 411.
—— sericiflora, i. 411.
—— *sericiflora*, i. 412.
—— truncata, i. 411.
—— trunciflora, i. 411.
—— *trunciflora*, i. 412.
—— warszewiczii, i. 411.
—— xalapensis, i. 411.
—— *xalapensis*, i. 412.
Eugonolobus edulis, ii. 331.
—— pogonanthus, ii. 333.
Euheliotropium palmeri, iv. 72.
EULOPHIA, iii. 248.
Eulophia dilatata, iii. 215.
—— filicaulis, iii. 248.
EULOPHUS, i. 565.
Eulophus peucedanoides, i. 565.
—— texanus, iv. 46.
Eumecanthus arenarius, iii. 91.
—— *ariensis*, iii. 91.
—— *benthamianus*, iii. 91.
—— *triphyllus*, iii. 100.
EUMIMOSEÆ, i. 345.
EUONYMUS, i. 188.
Euonymus acuminatus, i. 188.
—— mexicanus, i. 188.
—— parviflorus, i. 188.
Euothonæa oppositifolia, iii. 219.
EUPAPAVEREÆ, i. 26.
EUPATORIACEÆ, ii. 77.
Eupatoriaceæ, iv. 183.
EUPATORIUM, ii. 91.
Eupatorium, ii. 77; iv. 148, 149, 212, 252.
Eupatorium adenochætum, ii. 91.
—— *adenochætum*, iv. 287.
—— adenophorum, ii. 91.
—— *adenophorum*, iv. 287.
—— adenospermum, ii. 91.
—— ageratifolium, ii. 91.
—— ageratoides, ii. 91.
—— albicaule, ii. 92.
—— album, ii. 92.
—— *album*, iv. 50.
—— amplifolium, ii. 92.
—— angosturæ, ii. 92.
—— araliæfolium, ii. 92.
—— areolare, ii. 92.
—— argutum, ii. 92.

Eupatorium argutum, iv. 287.
—— aschenbornianum, ii. 92.
—— azureum, ii. 92; iv. 50.
—— barclayanum, ii. 92.
—— bellidifolium, ii. 92.
—— *bellidifolium*, iv. 287.
—— berlandieri, ii. 92.
—— bertholdii, ii. 92.
—— betonicæfolium, ii. 91.
—— betonicum, ii. 93; iv. 50.
—— *biceps*, iv. 50.
—— bigelowii, ii. 93.
—— billbergianum, ii. 93.
—— blepharilepis, ii. 93.
—— braunii, ii. 93.
—— brevipes, ii. 93.
—— brevisetum, ii. 93.
—— bustamenta, ii. 93.
—— calaminthæfolium, ii. 93.
—— *canescens*, iv. 51.
—— *capillare*, ii. 105.
—— ciliatum, ii. 93.
—— coahuilense, iv. 50.
—— collinum, ii. 93.
—— conyzoides, ii. 94.
—— *conyzoides*, iv. 112.
—— critonioides, ii. 94.
—— daleoides, ii. 94.
—— deltoideum, ii. 94.
—— *denticulatum*, ii. 103.
—— *diffusum*, ii. 105.
—— dissectum, ii. 94.
—— divergens, ii. 94.
—— ehrenbergii, ii. 94.
—— elatum, ii. 94.
—— espinosarum, ii. 94.
—— *gabellum*, iv. 50.
—— glaberrimum, ii. 94.
—— glabratum, ii. 94.
—— *glabrum*, iv. 50.
—— *glandulosum*, ii. 91.
—— glaucum, ii. 95.
—— *glaucum*, iv. 50.
—— gonocladum, ii. 95.
—— graciliflorum, ii. 95.
—— grandidentatum, ii. 95.
—— *grandidentatum*, iv. 287.
—— guatemalense, ii. 95.
—— hænkeanum, ii. 95.
—— hartwegii, ii. 95.
—— hastile, ii. 95.
—— hebebotrya, ii. 95.
—— hederæfolium, ii. 95
—— hirsutum, ii. 95.
—— *houstonis*, ii. 103.
—— hyssopinum, ii. 95.
—— ianthinum, ii. 96.
Eupatorium ianthinum, iv. 287.
—— incarnatum, iv. 50.
—— incomptum, ii. 96.
—— *iodopappum*, iv. 50.
—— iresinoides, ii. 96.
—— ivæfolium, ii. 96.
—— ixiocladon, ii. 96.
—— *ixiocladon*, iv. 159, 287.
—— karwinskianum, ii. 96.
—— lævigatum, ii. 96.
—— lasioneurum, ii. 96.
—— leiophyllum, ii. 96.
—— *leptopodum*, ii. 105.
—— leucocephalum, ii. 96.
—— liebmannii, ii. 96.
—— ligustrinum, ii. 96; iv. 50.
—— longipes, ii. 97.
—— lucidum, ii. 97.
—— macrocephalum, ii. 97.
—— macrophyllum, ii. 97; iv. 112.
—— mairetianum, ii. 97.
—— malvæfolium, ii. 97.
—— melanolepis, ii. 97.
—— mendezii, ii. 97.
—— mexicanum, ii. 91.
—— micranthum, ii. 97; iv. 50.
—— monanthum, ii. 97.
—— *morisii*, iv. 50.
—— multinerve, ii. 97.
—— multiserratum, ii. 97.
—— mygindæfolium, ii. 97.
—— *myriadenium*, iv. 50.
—— neæanum, ii. 98.
—— *nigrescens*, ii. 93.
—— nubigenum, ii. 98.
—— *nutans*, ii. 106.
—— oaxacanum, iv. 50.
—— *odoratissimum*, iv. 50.
—— odoratum, ii. 98.
—— *odoratum*, iv. 50.
—— œrstedianum, ii. 98.
—— oliganthes, ii. 98.
—— *oliganthes*, ii. 106.
—— oligocephalum, ii. 98.
—— oligolepis, ii. 98.
—— orizabæ, ii. 98.
—— *orizabæ*, iv. 287.
—— ovaliflorum, ii. 98.
—— paniculatum, ii. 98; iv. 112.
—— papantlense, ii. 98.
—— parryi, ii. 98.
—— pazcuarense, ii. 98.
—— *pedunculosum*, ii. 97.
—— *pendulum*, ii. 106.
—— petiolare, ii. 98; iv. 50.
—— plectranthifolium, ii. 99.
—— polybotryum, ii. 99.
Eupatorium popocatapetlense, ii. 99.
—— populifolium, ii. 99.
—— porphyranthemum, ii. 99.
—— prunellæfolium, ii. 99.
—— psiadiæfolium, ii. 99.
—— puberum, ii. 101.
—— pulchellum, ii. 99.
—— pycnocephalum, ii. 99.
—— quadrangulare, ii. 99.
—— *quinquesetosum*, ii. 90.
—— quinquesetum, ii. 99.
—— rhodochlamydeum, ii. 99.
—— rhomboideum, ii. 99.
—— *rhomboideum*, iv. 287.
—— *rigidum*, ii. 105.
—— riparium, ii. 100.
—— *rosalesia*, ii. 106.
—— *roseum*, iv. 50.
—— rubricaule, ii. 100.
—— sagittatum, ii. 100.
—— *scandens*, ii. 104.
—— schaffneri, ii. 100.
—— schiedeanum, ii. 100.
—— schultzii, ii. 100.
—— scorodonioides, ii. 100.
—— *secundiflorum*, ii. 106.
—— semialatum, ii. 100.
—— *semialatum*, iv. 287, 288.
—— serotinum, iv. 50.
—— sideritis, ii. 100.
—— sinclairii, ii. 100.
—— sonoræ, ii. 100.
—— sordidum, ii. 100.
—— spinaciæfolium, ii. 101.
—— spirææfolium, ii. 101.
—— splendens, ii. 101.
—— *squarrosum*, ii. 104.
—— stenolepis, ii. 101.
—— sternbergianum, ii. 101.
—— stillingiæfolium, ii. 101.
—— subcordatum, ii. 101.
—— *subcordatum*, iv. 288.
—— subobtusum, ii. 101.
—— *subuligerum*, ii. 102.
—— tepicanum, ii. 101.
—— tetragonum, ii. 101.
—— thespesiæfolium, ii. 101.
—— thyrsoideum, ii. 101.
—— tomentellum, ii. 101.
—— triangulatum, ii. 102.
—— trinervium, ii. 102.
—— tubiflorum, ii. 102.
—— tulanum, iv. 51.
—— turbinatum, ii. 102.
—— vanillosmoides, ii. 102.
—— velutinum, ii. 95.
—— vernale, iv. 51.

Eupatorium veronicæfolium, ii. 107.
—— viburnoides, ii. 102.
—— vitalba, ii. 102.
—— vulcanicum, ii. 102.
—— *vulcanicum*, iv. 288.
—— *weinmannianum*, iv. 50.
EUPHORBIA, iii. 89.
Euphorbia, iv. 110, 147, 149, 163, 212, 260.
Euphorbia acuta, iv. 85.
—— acutifolia, iii. 95.
—— adenoptera, iii. 90.
—— adiantoides, iii. 90.
—— ammannioides, iii. 90.
—— ammatotricha, iii. 91; iv. 85.
—— *anceps*, iii. 90.
—— angusta, iii. 90.
—— antisyphilitica, iii. 90.
—— anychioides, iii. 90.
—— apocynoides, iii. 91.
—— arenaria, iii. 91.
—— ariensis, iii. 91.
—— arizonica, iii. 91.
—— astroites, iii. 91.
—— astyla, iii. 91.
—— barbellata, iii. 91.
—— biformis, iv. 85.
—— bilobata, iii. 91.
—— boerhavifolia, iii. 91.
—— *bonplandii*, iii. 101.
—— *bracteata*, iii. 89.
—— buxifolia, iii. 91; iv. 114.
—— *callitrichoides*, iii. 90, 99.
—— calyculata, iii. 92.
—— campestris, iii. 92.
—— *canaliculata*, iii. 89, 95.
—— capitellata, iii. 92.
—— *carinata*, iii. 89.
—— chamæsula, iii. 92.
—— *cinerascens*, iii. 97.
—— colletioides, iii. 92.
—— colorata, iii. 92.
—— cotinifolia, iii. 92; iv. 114.
—— cumbræ, iii. 93; iv. 85.
—— cuphosperma, iii. 93.
—— *cuspidata*, iii. 96.
—— cyathophora, iii. 95.
—— delicatula, iii. 93.
—— dentata, iii. 93.
—— ——, γ. *cuphosperma*, iii. 93.
—— ——, var. *mexicana*, iii. 97.
—— *dioica*, iii. 90.
—— dioscoreoides, iii. 93.
—— discolor, iii. 93.
—— *elliptica*, iii. 94.
—— *erythrophylla*, iii. 99.
—— esulæformis, iii. 92.
Euphorbia exclusa, iv. 85.
—— exstipulata, iii. 93.
—— fendleri, iii. 93.
—— *fimbrilligera*, iii. 97.
—— floribunda, iii. 93.
—— florida, iii. 94.
—— francoana, iii. 94.
—— *frangulæfolia*, iii. 94.
—— friedrichsthalii, iii. 94.
—— fruticulosa, iii. 94.
—— fulgens, iii. 94.
—— furcillata, iii. 94.
—— *furcillata*, iv. 293.
—— *gemella*, iii. 98.
—— geniculata, iii. 94.
—— genuina, iii. 95.
—— glaberrima, iii. 94, 99.
—— *globulifera*, iii. 98.
—— glyptosperma, iii. 94.
—— graminea, iii. 95.
—— *graminea*, iii. 100.
—— greggii, iii. 95.
—— grisea, iii. 95.
—— hartwegiana, iii. 95.
—— heterophylla, iii. 95; iv. 108.
—— hoffmanniana, iii. 95.
—— *humboldtii*, iii. 95.
—— hypericifolia, iii. 96; iv. 108, 114.
—— indivisa, iii. 90.
—— *jacquiniæflora*, iii. 94.
—— karwinskyi, iii. 96.
—— lacera, iii. 96.
—— lancifolia, iii. 96.
—— lasiocarpa, iii. 93, 96.
—— lathyris, iii. 96.
—— *leptalea*, iii. 95.
—— leucantha, iii. 96.
—— ligustrina, iii. 96.
—— macropus, iii. 97.
—— maculata, iii. 97.
—— *marginata*, iii. 101.
—— melanadenia, iii. 97.
—— mendezii, iii. 97.
—— montani, iii. 97.
—— *morisoniana*, iii. 91.
—— multicaulis, iii. 97.
—— multiseta, iii. 97.
—— *nuda*, iii. 95.
—— *nudiflora*, iii. 95.
—— *occulta*, iii. 90.
—— ocymoidea, iii. 97.
—— *ocymoides*, iii. 90.
—— œrstediana, iii. 98.
—— orizabæ, iii. 98.
—— *orizabæ*, iv. 293.
—— pediculifera, iii. 98.
Euphorbia pedunculata, iii. 101.
—— peganoides, iii. 98.
—— *perforata*, iii. 99.
—— petiolaris, iv. 114.
—— physalifolia, iii. 98.
—— pilosula, iii. 98.
—— pilulifera, iii. 98; iv. 108, 114.
—— podadenia, iii. 98.
—— polycarpa, iii. 98; iv. 85.
—— preslii, iii. 99.
—— procumbens, iii. 98.
—— prostrata, iii. 99.
—— *prostrata*, iv. 231.
—— *prunifolia*, iii. 94.
—— pulcherrima, iii. 99.
—— *pulcherrima*, iv. 260.
—— pycnanthema, iii. 99.
—— radians, iii. 99; iv. 85.
—— radicans, iii. 100.
—— radioloides, iii. 99.
—— *recta*, iii. 92.
—— restiacea, iii. 99.
—— revoluta, iii. 99.
—— rigida, iii. 93.
—— saccharata, iii. 100.
—— scabrella, iii. 100.
—— scandens, iii. 100.
—— schlechtendalii, iii. 100.
—— scotana, iii. 100.
—— seemanni, iii. 92.
—— segoviensis, iii. 100.
—— serpens, iii. 100.
—— serpyllifolia, iv. 85.
—— serrula, iv. 85.
—— sphærorrhiza, iii. 101.
—— strigosa, iii. 101.
—— subinappendiculata, iii. 97.
—— subsinuata, iii. 95.
—— *tenella*, iii. 99.
—— tenera, iv. 85.
—— thymifolia, iii. 101.
—— *tithymaloides*, iii. 89.
—— tomentella, iii. 101.
—— torrida, iii. 101.
—— trachysperma, iii. 101.
—— *trichogona*, iii. 99.
—— trichotoma, iv. 108.
—— *trichotoma*, iv. 110.
—— umbellulata, iii. 101.
—— velleriflora, iii. 101.
—— velligera, iii. 102.
—— vestita, iii. 102.
—— villifera, iii. 102; iv. 86.
—— xalapensis, iii. 102.
—— zierioides, iii. 102.
EUPHORBIACEÆ, iii. 88; iv. 85, 108.

Euphorbiaceæ, i. 45; iv. 193, 202, 215, 217, 226, 231, 233, 260.
Euphorbiastrum hoffmannianum, iii. 95.
Euphrasia santolinæfolia, ii. 464.
Euphrasioides parviflora, ii. 465.
EUPHROSYNE, ii. 149.
Euphrosyne parthenifolia, ii. 149.
Euploca convolvulacea, ii. 374.
—— xalapense, ii. 102.
EUROTIA, iii. 25.
Eurotia ceratoides, iii. 26.
—— lanata, iii. 26.
Euryandra, i. 12.
Euryanthe schiedeana, i. 55.
Eustachys petræa, iii. 559.
—— *submutica*, iii. 559.
EUSTOMA, ii. 348.
Eustoma, ii. 347.
—— *chironioides*, ii. 348.
—— exaltatum, ii. 348; iv. 105, 113.
—— *lacteum*, ii. 348.
—— *maculatum*, ii. 347.
—— russelianum, ii. 349.
—— *silenifolium*, ii. 348.
EUTERPE, iii. 401.
Euterpe andicola, iv. 276.
—— *edulis*, iv. 152.
—— leucospadix, iii. 401.
—— longepetiolata, iii. 401.
—— macrospadix, iii. 401.
EUTETRAS, ii. 209.
Eutetras palmeri, ii. 209.
Eutoca, iv. 304.
—— *andrieuxii*, ii. 359.
—— *glandulosa*, ii. 359.
—— *mexicana*, ii. 359.
—— *pimpinelloides*, ii. 359.
Eutrema, i. 35.
Eutriana, iii. 560.
—— *aristidoides*, iii. 561.
—— *bromoides*, iii. 561.
—— *curtipendula*, iii. 563.
—— *juncifolia*, iii. 561.
—— *repens*, iii. 561.
—— *triæna*, iii. 564.
Euxolus emarginatus, iii. 14.
Evelyna capitata, iii. 217; iv. 302.
—— *graminifolium*, iii. 217.
—— *hymenophora*, iii. 217.
Evernia, iv. 149.
—— *furfuracea*, iv. 150.
—— *ochroleuca*, iv. 151.
Evodianthus, iv. 92.
—— *angustifolius*, iii. 416.
EVOLVULUS, ii. 398.
Evolvulus acapulcensis, ii. 398.
Evolvulus albiflorus, ii. 398.
—— alsinoides, ii. 398.
—— argenteus, ii. 399.
—— argyreus, ii. 399.
—— arizonicus, ii. 399.
—— discolor, ii. 399; iv. 74.
—— *glabriusculus*, ii. 399.
—— holosericeus, ii. 399.
—— *holosericeus*, var. *obtusatus*, ii. 399.
—— *linifolius*, ii. 398.
—— *linoides*, ii. 398.
—— *microphyllus*, ii. 398.
—— mucronatus, ii. 399.
—— nummularius, ii. 399.
—— *ovalifolius*, ii. 400.
—— *pilosissimus*, ii. 398.
—— sericeus, ii. 399.
—— *veronicæfolius*, ii. 399.
—— villosus, ii. 399.
Exadenus alatus, ii. 351.
—— *parviflorus*, ii. 352.
—— *paucifolius*, ii. 352.
Excæcaria biglandulosa, iii. 136.
—— ——, ζ. *klotzschiana*, iii. 136.
—— ——, ξ. *moritziana*, iii. 136.
—— *riparia*, iii. 137.
Exogonium, iv. 256.
—— *bracteatum*, ii. 384.
—— *dumosum*, ii. 393.
—— *olivæ*, ii. 384.
—— *purga*, ii. 393.
—— *spicatum*, ii. 384.
Exostema, ii. 13.
EXOSTEMMA, ii. 13.
Exostemma canescens, ii. 13.
—— caribæum, ii. 13.
—— coulteri, ii. 13.
—— longicuspe, ii. 13.
—— mexicanum, ii. 14.
—— *occidentale*, ii. 14.
Exothostemon contortum, ii. 311.
—— *sericeum*, ii. 312.
EYSENHARDTIA, i. 235.
Eysenhardtia, iv. 239.
Eysenhardtia adenostylis, i. 235.
—— amorphoides, i. 236; iv. 26, 95.
—— *amorphoides*, var. *orthocarpa*, iv. 26.
—— orthocarpa, iv. 26.
—— spinosa, i. 236.

Fadyenia, iii. 641.
Fagonia, i. 158.
Fagus, iii. 165; iv. 260.
FALLUGIA, i. 374.
Fallugia, iv. 240.
Fallugia paradoxa, i. 374.
—— *paradoxa*, iv. 140.
FARAMEA, ii. 47.
Faramea odoratissima, ii. 47.
—— suaveolens, ii. 47.
FENDLERA, i. 384.
Fendlera rupicola, i. 384.
—— *rupicola*, iv. 141.
Feraria pavonia, iii. 327.
—— *tigrida*, iii. 327.
Ferdinanda angusta, ii. 159.
—— *eminens*, ii. 192.
—— *lutescens*, ii. 159.
—— *montagnæfolia*, ii. 160.
—— *oppositifolia*, ii. 206.
Fernandezia, iii. 291.
—— *elegans*, iii. 291.
—— *robusta*, iii. 292.
Ferula tolucensis, i. 570.
FESTUCA, iii. 581.
Festuca, iii. 567; iv. 148, 149.
Festuca æquipaleata, iii. 581.
—— *æquipaleata*, iv. 297.
—— *amplissima*, iii. 581; iv. 297.
—— *fascicularis*, iii. 569.
—— fournieriana, iii. 581.
—— fratercula, iii. 581.
—— *fratercula*, iv. 297.
—— *grandiflora*, iii. 582.
—— hephæstophila, iii. 581; iv. 297.
—— liebmanni, iii. 582.
—— livida, iii. 582.
—— *livida*, iv. 297.
—— *mexicana*, iii. 584.
—— *multiculmis*, iii. 582.
—— muralis, iii. 582.
—— *myurus*, iii. 582.
—— *obtusiflora*, iii. 569.
—— orgyalis, iii. 582.
—— *pendulina*, iii. 583.
—— *pilosa*, iii. 574.
—— *procera*, var. *mexicana*, iii. 582.
—— *pumila*, iii. 582.
—— *scabra*, iii. 584.
—— tolucensis, iii. 582.
—— *tolucensis*, iii. 581; iv. 297.
—— *unioloides*, iii. 584.
—— *virgata*, iii. 566.
—— *willdenowiana*, iii. 583.
FESTUCEÆ, iii. 567.
Feuillea, iv. 43.
—— *cordifolia*, iv. 43.
—— ——, var. β. hederacea, iv. 43.
Fevillea tamnifolia, i. 491.
FICOIDEÆ, i. 555.

Ficoideæ, iv. 181, 205, 217, 225, 233.
Ficus, iii. 143.
Ficus, iii. 145, 147; iv. 213, 300.
Ficus anthelmintica, iii. 143.
—— arbutifolia, iii. 143.
—— baccata, iii. 144.
—— bonplandiana, iii. 144.
—— botryapioides, iii. 144.
—— chiriquiana, iii. 141.
—— complicata, iii. 144.
—— consanguinea, iii. 144.
—— costaricana, iii. 144.
—— cotinifolia, iii. 144.
—— coybana, iii. 144.
—— eugeniæfolia, iii. 144.
—— fuscescens, iii. 145.
—— glabrata, iii. 143.
—— glauca, iii. 145.
—— glaucescens, iii. 145.
—— glycicarpa, iii. 145.
—— guatemalana, iii. 145.
—— gummifera, iii. 145.
—— hernandezii, iii. 145.
—— intramarginalis, iii. 145.
—— involuta, iii. 145.
—— lancifolia, iii. 145.
—— lapathifolia, iii. 146.
—— liebmanniana, iii. 146.
—— ligustrina, iii. 146.
—— longipes, iii. 146.
—— mexicana, iii. 146.
—— myxæfolia, iii. 146.
—— nymphæifolia, iii. 146.
—— *obtusifolia*, iii. 144.
—— œrstediana, iii. 146.
—— ovalis, iii. 146.
—— padifolia, iii. 147.
—— petiolaris, iii. 147.
—— populnea, iii. 147.
—— *prinoides*, iii. 146.
—— protensa, iii. 147.
—— pseudoradula, iii. 147.
—— radula, iii. 147.
—— sapida, iii. 147.
—— segoviæ, iii. 147.
—— sulcipes, iii. 148.
—— tecolutensis, iii. 148.
—— turbinata, iii. 148.
—— verrucosa, iii. 148.
—— warscewiczii, iii. 148.
FILICES, iii. 589.
Filices, iv. 95.
Filices, iv. 109, 200, 201, 202, 215, 217, 280.
Fimbristemma, ii. 336.
Fimbristemma, iv. 254.
Fimbristemma warscewiczii, ii. 336.
Fimbristylis, iii. 458.
Fimbristylis autumnalis, iii. 458.
—— *brizoides*, iii. 460.
—— ——, var. *pumila*, iii. 460.
—— *capillacea*, iii. 459.
—— capillaris, iii. 459.
—— castanea, iii. 459.
—— crassipes, iii. 459.
—— ferruginea, iii. 459.
—— *humboldtii*, iii. 460.
—— *juncifolia*, iii. 460.
—— miliacea, iii. 459.
—— monostachya, iii. 459.
—— pentastachia, iii. 460.
—— polymorpha, iii. 460; iv. 114.
—— *preslii*, iii. 460.
—— spadicea, iii. 460.
—— *spadicea*, iii. 459.
—— sublateralis, iii. 460.
—— vahlii, iii. 460.
—— vestita, iii. 460.
Fintelmannia, iii. 468.
Fischeria, ii. 320.
Fischeria heterophylla, ii. 320.
—— martiana, ii. 320.
Flacourtia celastrinea, i. 57.
—— *cinerea*, i. 57.
—— *flexuosa*, i. 57.
FLACOURTIEÆ, i. 56.
Flagellarieæ, iv. 197.
Flaveria, ii. 215.
Flaveria, iv. 234, 252.
Flaveria angustifolia, ii. 216; iv. 59.
—— chloræfolia, ii. 216; iv. 59.
—— contrayerba, ii. 216.
—— *contrayerba*, ii. 215.
—— linearis, ii. 216; iv. 103.
—— longifolia, ii. 216; iv. 59, 112.
—— repanda, ii. 216; iv. 60.
Fleischmannia, ii. 90.
Fleischmannia rhodostylis, ii. 90.
—— schaffneri, ii. 91.
—— urenæfolia, ii. 91.
Fleurya, iii. 154.
Fleurya æstuans, iii. 154.
—— *cordata*, iii. 154.
—— racemosa, iii. 154.
Florestina, ii. 213.
Florestina pedata, ii. 214.
—— tripteris, ii. 214; iv. 59.
Flourensia, iv. 56.
—— *cernua*, ii. 179; iv. 141.
—— *laurifolia*, ii. 179.
Forchammeria, i. 45; iii. 105; iv. 7.
Forchammeria apiocarpa, iv. 7.
—— pallida, i. 45; iii. 105.
Forestiera, ii. 305.
Forestiera angustifolia, ii. 305.
—— *ligustrina*, var. *pubescens*, ii. 306.
—— phyllyreoides, ii. 305.
—— pubescens, ii. 306.
Forsteronia, ii. 312.
Forsteronia difformis, ii. 313.
—— spicata, ii. 312.
Fougerouxia alba, ii. 144.
—— *recta*, ii. 144.
Fouquieria, i. 81.
Fouquieria, iv. 12, 140, 236.
Fouquieria formosa, i. 81.
—— spinosa, i. 81.
—— splendens, i. 81; iv. 12.
—— *splendens*, iv. 141.
FOUQUIERIEÆ, i. 81.
Fouquierieæ, iv. 12, 236.
Fourcroya, iii. 352.
—— *rigida*, iii. 348.
—— *tubiflora*, iii. 338.
Fragaria, i. 375.
Fragaria mexicana, i. 375.
—— *mexicana*, iv. 149.
—— *vesca*, i. 375.
Frangula californica, i. 197.
Frankenia, i. 66.
Frankenia grandifolia, i. 66; iv. 10.
FRANKENIACEÆ, i. 65; iv. 10.
Frankeniaceæ, iv. 173, 205, 216, 224.
Franseria, ii. 151.
Franseria albicaulis, ii. 151.
—— ambrosioides, ii. 151.
—— deltoidea, ii. 151.
—— *deltoidea*, iv. 142.
—— dumosa, ii. 151.
—— hookeriana, ii. 151.
—— tenuifolia, ii. 151.
Fraxinus, ii. 304.
Fraxinus berlandieriana, ii. 305.
—— cuspidata, ii. 304.
—— dipetala, ii. 305.
—— greggii, ii. 305.
—— pistaciæfolia, ii. 305.
—— schiedeana, ii. 305.
—— *schiedeana*, var. *parvifolia*, ii. 305.
—— *velutina*, ii. 305.
—— *velutinus*, iv. 141.
—— viridis, ii. 305.
Fregea, iii. 296.
Fregea amabilis, iii. 226.
Fregirardia, ii. 423.
Fregirardia ligustrina, ii. 423.
Fremontia, i. 129.
—— *californica*, iv. 237.

FREMONTIEÆ, i. 129.
FREZIERA, i. 93.
Freziera, iv. 163.
—— *chrysophylla*, i. 93.
—— *hirsuta*, i. 93.
—— *integrifolia*, i. 93.
—— sericea, i. 93.
—— theoides, i. 93.
Fritillaria, iii. 379.
—— *barbata*, iii. 380.
—— *purpurea*, iii. 380.
FRŒLICHIA, iii. 19.
Frœlichia floridana, iii. 19.
—— interrupta, iii. 19.
FUCHSIA, i. 456.
Fuchsia, i. 449; iv. 163, 166, 234, 243, 244, 313, 314.
—— *acynifolia*, i. 460, 461.
—— arborescens, i. 456.
—— *arborescens*, i. 461; iv. 285.
—— bacillaris, i. 456.
—— *bacillaris*, i. 461; iv. 285, 313.
—— cordifolia, i. 457.
—— *cordifolia*, i. 458, 460, 461; iv. 285.
—— *cylindracea*, i. 460.
—— *encliandra*, i. 460.
—— fulgens, i. 457.
—— *fulgens*, i. 461.
—— intermedia, i. 457.
—— *intermedia*, i. 458, 461; iv. 285.
—— microphylla, i. 458.
—— *microphylla*, i. 459, 461; iv. 148, 150, 285, 313.
—— minimiflora, i. 458.
—— *minimiflora*, i. 461.
—— minutiflora, i. 459.
—— *minutiflora*, i. 461.
—— mixta, i. 459.
—— *mixta*, i. 461; iv. 285.
—— *paniculata*, i. 456.
—— parviflora, i. 460.
—— *parviflora*, i. 461; iv. 285.
—— splendens, i. 460.
—— *splendens*, i. 457, 458, 461.
—— *syringæflora*, i. 456.
—— *tetradactyla*, i. 460.
—— thymifolia, i. 460.
—— *thymifolia*, i. 456, 461; iv. 313.
Fugosia, i. 123.
FUIRENA, iii. 462.
Fuirena hexachæta, iii. 463.
—— *obtusiflora*, iii. 463.
—— repens, iv. 93.
—— *schiedeana*, iii. 463.
—— simplex, iii. 463.
Fuirena squarrosa, iii. 463.
—— *tereticulmis*, iii. 463.
—— umbellata, iii. 463.
Fulcaldea tomentosa, ii. 72.
Fumaria parviflora, i. 28.
Fumariaceæ, iv. 172, 205, 216, 224.
FUMARIEÆ, i. 28.
Funaria hygrometrica, iv. 148.
Funium pitiferum, iii. 353.
FURCRÆA, iii. 352.
Furcræa, iii. 353; iv. 155, 167, 272, 273, 309.
Furcræa bedinghausii, iii. 352.
—— *cubensis*, iv. 273.
—— desmouliniana, iii. 352.
—— elegans, iii. 352.
—— flavo-viridis, iii. 352.
—— *fœtida*, iii. 353.
—— gigantea, iii. 352.
—— *gigantea*, iv. 264, 272, 273.
—— longæva, iii. 353.
—— *longæva*, iv. 272, 295.
—— selloa, iii. 353.
—— *tuberosa*, iv. 273.
—— *tubiflora*, iii. 338.
—— undulata, iii. 353.
—— *viridis*, iii. 353.

Gagea, iii. 379.
GAILLARDIA, ii. 228.
Gaillardia comosa, iv. 62.
—— pinnatifida, ii. 228; iv. 62.
—— *pinnatifida*, iv. 141.
—— pulchella, ii. 228.
—— simplex, iv. 63.
—— mexicana, iv. 62.
Gaimardia, iv. 207.
GALACTIA, i. 301.
Galactia brachystachys, i. 301; iv. 30.
—— *brevistyla*, i. 301.
—— *filiformis*, i. 301.
—— hirta, i. 301.
—— *hispidula*, i. 301.
—— marginalis, i. 301.
—— *pilosa*, i. 301.
—— *purpurea*, i. 296.
—— radiata, i. 301.
—— tenuiflora, i. 301.
—— tephrodes, i. 302.
—— tuberosa, i. 302.
—— wrightii, i. 302.
Galardia bicolor, ii. 228.
GALEANA, ii. 215.
Galeana hastata, ii. 215.
GALEANDRA, iii. 248.
Galeandra baueri, iii. 248.
GALEGEÆ, i. 234.
Galeoglossum, iii. 298.
—— *prescottioides*, iii. 298.
Galeottia, ii. 514.
—— *gracilis*, ii. 514.
—— *grandiflora*, iii. 251.
GALIEÆ, ii. 62.
GALINSOGA, ii. 204.
Galinsoga filiformis, ii. 204.
—— hispida, ii. 205.
—— parviflora, ii. 205.
—— *trilobata*, ii. 208.
—— *urticæfolia*, ii. 161.
Galinsogea balbisioides, ii. 207.
Galinsogeopsis spilanthoides, ii. 215.
GALIUM, ii. 63.
Galium, ii. 62; iv. 149, 150, 163.
Galium angustifolium, ii. 65.
—— aschenbornii, iv. 48.
—— asperrimum, ii. 63.
—— canescens, ii. 64.
—— *canescens*, iv. 287.
—— *ciliatum*, ii. 62.
—— denticulatum, ii. 64.
—— fuscum, ii. 64.
—— *fuscum*, iv. 287.
—— geminiflorum, ii. 64.
—— *geminiflorum*, iv. 287.
—— glaberrimum, ii. 64.
—— hirsutum, ii. 64.
—— hypadenium, ii. 64.
—— *involucratum*, ii. 62.
—— jalapense, ii. 64.
—— latifolium, ii. 65.
—— leucotrichum, ii. 65.
—— mexicanum, ii. 65.
—— *microphyllum*, ii. 63.
—— obstipum, ii. 65; iv. 48.
—— *obstipum*, iv. 287.
—— orizabense, ii. 65.
—— proliferum, ii. 66; iv. 48.
—— triflorum, ii. 66.
—— uncinulatum, ii. 66.
—— *uncinulatum*, ii. 65.
—— uropetalum, ii. 66.
—— wrightii, ii. 66.
GALPHIMIA, i. 148.
Galphimia angustifolia, i. 149.
—— angustifolia, iv. 16.
—— glandulosa, i. 149.
—— glauca, i. 148.
—— *glauca*, i. 149.
—— gracilis, i. 149.
—— grandiflora, i. 149.
—— hirsuta, i. 149.
—— humboldtiana, i. 149.

Galphimia latifolia, i. 149.
—— linifolia, i. 149.
—— *linifolia*, iv. 16, 140.
—— *mollis*, i. 153.
—— multicaulis, i. 149.
—— oblongifolia, i. 149.
—— ovalifolia, i. 149.
—— paniculata, i. 149.
Gamopetalæ, iv. 208, 209, 218, 219, 227.
GARCIA, iii. 109.
Garcia nutans, iii. 109.
Gardenia, iv. 101.
GARDENIEÆ, ii. 38.
GARDOQUIA, ii. 550.
Gardoquia betonicoides, ii. 568.
—— helleri, ii. 550.
—— mexicana, ii. 550.
—— micromerioides, ii. 550.
Garnotia, iii. 515.
GARRYA, i. 576.
Garrya, iv. 127.
Garrya laurifolia, i. 576.
—— macrophylla, i. 576.
—— oblonga, i. 576.
—— ovata, i. 576.
Gasteranthopsis glabra, ii. 488.
—— *hirsuta*, ii. 488.
Gastromeria physalodes, ii. 456.
GAUDICHAUDIA, i. 156.
Gaudichaudia acuminata, i. 156.
—— albida, i. 156.
—— arnottiana, i. 156.
—— brevipes, i. 156.
—— congestiflora, i. 156.
—— cynanchoides, i. 156.
—— enrico-martinezii, i. 156.
—— filipendula, i. 156.
—— *humilis*, i. 157.
—— karwinskiana, i. 156.
—— mollis, i. 156.
—— *mucronata*, i. 156.
—— oxyota, i. 157.
—— pentandra, i. 157.
—— podocarpa, i. 157.
—— schiedeana, i. 157.
—— webbiana, i. 157.
GAUDICHAUDIEÆ, i. 155.
GAULTHERIA, ii. 280.
Gaultheria, iv. 148, 254.
Gaultheria acuminata, ii. 280.
—— *ciliata*, ii. 280; iv. 149, 150.
—— *cordata*, ii. 281.
—— glaucifolia, ii. 281.
—— *hirsuta*, ii. 281.
—— hirtiflora, ii. 281.
—— *lævigata*, ii. 281.
Gaultheria mexicana, ii. 281.
—— nitida, ii. 281.
—— odorata, ii. 281.
—— *odorata*, iv. 290.
—— œrstediana, iv. 157.
—— ovata, ii. 281.
—— trichocalycina, ii. 281.
GAURA, i. 466.
Gaura, iv. 140, 149.
Gaura bracteata, i. 466.
—— coccinea, i. 466.
—— epilobia, i. 467.
—— *epiloboides*, i. 466.
—— *hexandra*, i. 467.
—— hispida, i. 467.
—— mollis, i. 467.
—— mutabilis, i. 467.
—— parviflora, i. 467; iv. 38.
—— primiveris, i. 467.
—— *suffrutescens*, i. 466.
—— tripetala, i. 467.
—— *tripetala*, iv. 285.
Gauridium molle, i. 467.
—— *mutabile*, i. 467.
GAYA, i. 102.
Gaya disticha, i. 102.
—— hermannioides, i. 102.
—— subtriloba, i. 102.
Gaylussacia cordata, ii. 274.
Gayophytum, iv. 243.
Geiseleria chamædryfolia, iii. 110.
GELASINE, iv. 91.
Gelasine longispatha, iii. 328.
—— *punctata*, iii. 329.
—— trichantha, iv. 91.
GELSEMIUM, ii. 338.
Gelsemium, iv. 229.
—— *lucidium*, ii. 338.
—— sempervirens, ii. 338.
GENIOSTEMON, ii. 347.
Geniostemon, iv. 255.
Geniostemon coulteri, ii. 347.
—— schaffneri, ii. 347.
GENIPA, ii. 40.
Genipa caruto, ii. 41; iv. 47.
GENISTEÆ, i. 225.
GENTIANA, ii. 349.
Gentiana, iv. 149, 255.
Gentiana acuta, ii. 350.
—— adsurgens, ii. 349.
—— amarella, ii. 350.
—— *amarella*, iv. 255.
—— angustifolia, ii. 350.
—— benthami, ii. 351.
—— cæspitosa, ii. 350.
—— *cæspitosa*, iv. 290.
—— calyculata, ii. 350.
Gentiana detonsa, ii. 351.
—— *exaltata*, ii. 348.
—— hartwegi, ii. 350.
—— lævigata, ii. 350.
—— lanceolata, ii. 350; iv. 70.
—— macrantha, ii. 350.
—— macrocalyx, ii. 350.
—— mexicana, ii. 350.
—— ovalis, ii. 351.
—— *ovalis*, iv. 290.
—— salpinx, ii. 351.
—— serrata, ii. 351.
—— sessæi, ii. 351.
—— spathacea, ii. 351.
—— wislizenii, ii. 351.
—— wrightii, ii. 351.
GENTIANACEÆ, iv. 70, 105.
GENTIANEÆ, ii. 344.
Gentianeæ, iv. 187, 203, 217, 225, 229, 231, 255.
Gentianella macrantha, ii. 350.
Genuinæ, iii. 531.
GEONOMA, iii. 408.
Geonoma, iii. 409; iv. 152, 276, 277.
Geonoma binervia, iii. 408.
—— cuneata, iii. 408.
—— edulis, iii. 408.
—— ferruginea, iii. 408.
—— flaccida, iii. 408.
—— galeottiana, iii. 408.
—— *ghiesbrechtiana*, iii. 410.
—— *glauca*, iii. 410.
—— gracilis, iii. 408.
—— hoffmanniana, iii. 408.
—— longepetiolata, iii. 408.
—— longevaginata, iii. 408.
—— magnifica, iii. 408.
—— *martiana*, iii. 409.
—— membranacea, iii. 409.
—— mexicana, iii. 409.
—— microspadix, iii. 409.
—— obovata, iii. 409.
—— procumbens, iii. 409.
—— *pulchra*, iii. 410.
—— *spicigera*, iii. 410.
—— trifurcata, iii. 409.
—— versiformis, iii. 409.
GEOPHILA, ii. 53.
Geophila reniformis, ii. 54; iv. 248.
—— violacea, ii. 54.
Georgia bipinnata, ii. 198.
Georgina cervantesii, ii. 196.
—— *coccinea*, ii. 196.
—— *frustranea*, ii. 196.
—— *scapigera*, ii. 197.

Georgina superflua, ii. 197.
—— *variabilis*, ii. 197.
Geræa albescens, ii. 183.
GERANIACEÆ, i. 160; iv. 17.
Geraniaceæ, iv. 176, 203, 216, 224.
GERANIEÆ, i. 160.
GERANIUM, i. 160.
Geranium, iv. 147, 158.
Geranium carolinianum, i. 160.
—— *carolinianum*, iv. 283.
—— crenatum, iv. 17.
—— gracile, i. 160.
—— hernandezii, i. 160.
—— *hernandezii*, iv. 283.
—— mexicanum, i. 160.
—— *mexicanum*, iv. 149.
—— potentillæfolium, i. 160.
—— *potentillæfolium*, iv. 283.
—— schiedeanum, i. 161.
—— seemanni, i. 161.
—— *seemanni*, iv. 283.
GERARDIA, ii. 459.
Gerardia dasyantha, ii. 459.
—— grandiflora, ii. 459.
—— *grandiflora*, iv. 77.
—— greggii, iv. 77.
—— *guatemalensis*, ii. 459.
—— *laciniata*, ii. 458.
—— peduncularis, ii. 459.
—— *prostrata*, ii. 458.
—— *purpurea*, iv. 148.
—— *serpyllifolia*, ii. 459.
—— *virgata*, ii. 458.
—— wrightii, ii. 459.
Gerbera ehrenbergii, ii. 255.
—— *lyrata*, ii. 255.
—— *nutans*, ii. 255.
—— *seemannii*, ii. 255.
—— *spathulata*, ii. 255.
Gerontogea, ii. 29.
—— *deppeana*, ii. 29.
—— *microtheca*, ii. 29.
GESNERA, ii. 480.
Gesnera cinnabarina, ii. 476.
—— *deppeana*, ii. 478.
—— *elongata*, ii. 478.
—— *geroltiana*, ii. 476.
—— *ignorata*, ii. 478.
—— *incurva*, ii. 478.
—— *lasiantha*, ii. 478.
—— *longifolia*, ii. 479.
—— maculata, ii. 480.
—— *petiolaris*, ii. 479.
—— *picta*, ii. 479.
—— rugata, iv. 79.
—— sartorii, ii. 480.
Gesnera schiedeana, ii. 479.
—— *seemanni*, ii. 479.
—— *spicata*, ii. 479.
—— *tubiflora*, ii. 480.
—— uniflora, ii. 480.
—— warscewiczii, ii. 481.
—— *zebrina*, ii. 476.
GESNERACEÆ, ii. 471; iv. 79.
Gesneraceæ, iv. 188, 202, 215, 217, 229, 257.
Gesnereæ, ii. 472.
Gesneria, ii. 480, 481.
GEUM, i. 375.
Geum album, i. 375.
—— *cercocarpoides*, i. 374.
—— *dryadoides*, i. 474.
—— virginianum, i. 375.
GHIESBREGHTIA, ii. 439.
Ghiesbreghtia calanthoides, iii. 217.
—— grandiflora, ii. 439.
GILIA, ii. 354.
Gilia acerosa, ii. 355.
—— aggregata, iv. 71.
—— aurea, ii. 355.
—— *glandulosa*, ii. 355.
—— *glomeriflora*, ii. 354.
—— *gracilis*, ii. 354.
—— gunnisoni, ii. 355.
—— incisa, ii. 355.
—— inconspicua, ii. 355.
—— *lindheimeriana*, ii. 355.
—— *longiflora*, ii. 354; iv. 141.
—— *pulchella*, iv. 71.
—— rigidula, ii. 355.
—— setosissima, ii. 355.
GILIBERTIA, i. 572.
Gilibertia populifolia, i. 572.
GLEICHENIA, iii. 589.
Gleichenia bancroftii, iii. 590.
—— dichotoma, iv. 115.
—— *glauca*, iii. 590.
—— hermanni, iii. 591.
—— intermedia, iv. 115.
—— *longissima*, iii. 590.
—— *mathewsii*, iii. 590.
—— nitida, iii. 591.
—— pectinata, iii. 590; iv. 115.
—— pubescens, iii. 590.
—— revoluta, iii. 591.
—— tenuis, iii. 591.
GLEICHENIACEÆ, iii. 589.
Glinus lotoides, i. 556.
GLIRICIDA, i. 259.
Gliricida maculata, i. 260; iv. 111.
GLOCKERIA, ii. 514.
Glockeria glandulosa, ii. 514.
—— gracilis, ii. 514.
Glockeria hæmatodes, ii. 514.
—— sessilifolia, ii. 514.
—— *sessilifolia*, iv. 157.
Glossoloma tetragonum, ii. 484.
GLOSSOPETALON, i. 191.
Glossopetalon spinescens, i. 191.
Glossopetalum spinescens, iv. 141.
GLOXINIA, ii. 473.
Gloxinia, ii. 476.
—— *antirrhina*, ii. 474.
—— *fimbriata*, ii. 473.
—— glabrata, ii. 473.
—— *guttata*, iv. 300.
—— micrantha, ii. 473.
—— *multiflora*, ii. 476.
—— pallidiflora, ii. 473.
—— *punctata*, ii. 476.
—— *verticillata*, ii. 473.
GLYCERIA, iii. 581.
Glyceria fluitans, iii. 581.
Glycine caribæa, i. 310.
—— *diffusa*, i. 312.
—— *discolor*, i. 297.
—— *elliptica*, i. 297.
—— *lamarckii*, i. 311.
—— *oblonga*, i. 297.
—— *precatoria*, i. 312.
—— *pulchella*, i. 312.
GLYCYRRHIZA, i. 267.
Glycyrrhiza lepidota, i. 267.
GLYPHOSPERMA, iii. 376.
Glyphosperma palmeri, iii. 376.
GNAPHALIUM, ii. 135.
Gnaphalium, ii. 134; iv. 54, 148, 149, 150, 213, 253.
Gnaphalium americanum, ii. 135.
—— arizonicum, iv. 54.
—— attenuatum, ii. 135.
—— berlandieri, ii. 136.
—— bourgovii, iv. 54.
—— brachypterum, ii. 136.
—— canescens, ii. 136.
—— *chamissonis*, ii. 135.
—— concinnum, ii. 136.
—— conoideum, ii. 136.
—— ehrenbergianum, ii. 136.
—— gracile, ii. 136.
—— heteroides, ii. 136.
—— hirtum, ii. 136.
—— inornatum, ii. 136.
—— *lavandulaceum*, ii. 134; iv. 159.
—— legitimum, ii. 137.
—— leptophyllum, ii. 136.
—— leucocephalum, ii. 136.
—— luteo-album, ii. 136.
—— oxyphyllum, ii. 137; iv. 54.
—— pannosum, iv. 54.

Gnaphalium polycephalum, ii. 137; iv. 54.
—— purpurascens, ii. 137; iv. 54.
—— *purpureum*, ii. 135.
—— rectum, ii. 138.
—— rhodanthum, ii. 137.
—— *rhodanthum*, iv. 288.
—— roseum, ii. 137.
—— *roseum*, iv. 54, 288.
—— schraderi, ii. 137.
—— *schraderi*, iv. 54, 288.
—— *seemanni*, ii. 134.
—— semiamplexicaule, ii. 137; iv. 54.
—— semilanatum, ii. 137.
—— *simplicicaule*, ii. 135.
—— sphacelatum, iii. 137.
—— *sphacelatum*, ii. 135.
—— spicatum, ii. 138.
—— *spicatum*, ii. 135.
—— sprengelii, ii. 138; iv. 54.
—— stramineum, ii. 138.
—— tenue, ii. 138.
—— viscosum, ii. 138.
Gnaphalopsis micropoides, ii. 220.
GNETACEÆ, iii. 182; iv. 88.
Gnetaceæ, iv. 194, 205, 226.
Gnetum, iii. 182.
GODMANIA, ii. 496.
Godmania macrocarpa, ii. 496.
Godwinia gigas, iii. 427; iv. 278.
GOMPHIA, i. 176.
Gomphia jurgensenii, i. 176.
—— magdalenæ, i. 176.
—— mexicana, i. 176.
—— nitida, i. 176; iv. 111.
Gomphocarpus, ii. 321.
—— *arachnoideus*, iv. 68.
—— *hypoleucus*, iv. 68.
—— *viridis*, ii. 321.
GOMPHRENA, iii. 18.
Gomphrena aggregata, iii. 17.
—— *albiflora*, iii. 18.
—— cæspitosa, iii. 18.
—— decumbens, iii. 18.
—— filaginoides, iii. 18.
—— globosa, iii. 18.
—— *gracilis*, iii. 16.
—— *interrupta*, iii. 19.
—— *latifolia*, iii. 22.
—— nitida, iii. 18.
—— pilosa, iii. 18.
—— *polygonoides*, iii. 16.
—— *prostrata*, iii. 18.
—— *pulverulenta*, iii. 19.
—— sonoræ, iii. 18.
—— tuberifera, iii. 19.
Gomphrena vermicularis, iii. 18.
GONGORA, iii. 255.
Gongora, iv. 152.
Gongora armeniaca, iii. 255.
—— aromatica, iii. 255.
—— *bufonia leucochila*, iii. 256.
—— cassidea, iii. 255.
—— *fulva*, iii. 256.
—— ——, var. *vitellina*, iii. 256.
—— galeata, iii. 255.
—— galeottiana, iii. 255.
—— *galeottiana*, iv. 303.
—— *leucochila*, iii. 256.
—— *maculata*, iii. 255.
—— ——, var. *alba*, iii. 256.
—— quinquenervis, iii. 255.
—— truncata, iii. 256.
GONGYLOCARPUS, i. 467.
Gongylocarpus rubricaulis, i. 468.
Goniophlebium adnatum, iii. 653.
—— *anisomeron*, iii. 667.
—— attenuatum, iii. 655.
—— calaguala, iii. 663.
—— chnoodes, iii. 656.
—— fraxinifolium, iii. 658.
—— guatemalense, iii. 659.
—— incanum, iii. 660.
—— *invertens*, iii. 663.
—— lasiopus, iii. 662.
—— lepidopteris, iii. 662.
—— *lepidotrichum*, iii. 669.
—— loriceum, iii. 663.
—— meniscifolium, iii. 664.
—— *molestum*, iii. 667.
—— neriifolium, iii. 664.
—— patens, iii. 665.
—— piloselloides, iii. 666.
—— platylepis, iii. 666.
—— plectolepis, iii. 667.
—— plesiosorum, iii. 667.
—— *pyrrholepis*, iii. 662.
—— *revertens*, iii. 658.
—— *rhagadiolepis*, iii. 671.
—— *rhodopleurum*, iii. 658.
—— *serratum*, iii. 669.
—— sessilifolium, iii. 669.
—— squamatum, iii. 669.
—— stenoloma, iii. 669.
—— thyssanolepis, iii. 670.
—— trilobum, iii. 671.
—— vaccinifolium, iii. 671.
Goniopteris crenata, iii. 656.
—— crenata, iii. 656.
—— eatoni, iii. 657.
—— faucium, iii. 658.
—— ghiesbreghtii, iii. 659.
—— heterophlebium, iii. 660.
Goniopteris leptocladia, iii. 670.
—— *megalodus*, iii. 670.
—— meniscoides, iii. 664.
—— *rostrata*, iii. 664.
—— tetragona, iii. 670.
GONOLOBUS, ii. 330.
Gonolobus, iv. 213, 254.
Gonolobus asper, ii. 330.
—— barbatus, ii. 330.
—— bifidus, ii. 330.
—— *biflorus*, ii. 330.
—— billbergianus, ii. 330.
—— chloranthus, ii. 331.
—— congestus, ii. 331.
—— diadematus, iv. 70.
—— edulis, ii. 331.
—— erianthus, ii. 331.
—— fraternus, ii. 331.
—— fuscus, ii. 331.
—— *fuscus*, ii. 320.
—— gracilis, ii. 331.
—— *grandiflorus*, ii. 331.
—— *granulatus*, ii. 334.
—— lanceolatus, ii. 331.
—— littoralis, ii. 332.
—— luridus, ii. 332.
—— luteolus, ii. 332.
—— macranthus, ii. 332.
—— *martianus*, ii. 320.
—— nemorosus, ii. 332.
—— niger, ii. 332.
—— nigrescens, ii. 332.
—— nummularius, ii. 332.
—— pedunculatus, ii. 332.
—— picturatus, ii. 332.
—— pilosus, ii. 333.
—— pogonanthus, ii. 333.
—— productus, ii. 333.
—— prostratus, ii. 333.
—— *prostratus*, ii. 334.
—— reflexus, ii. 333.
—— reticulatus, ii. 334.
—— salvinii, ii. 334.
—— schaffneri, ii. 334.
—— sidæfolius, ii. 334.
—— *stellatus*, ii. 334.
—— striatus, ii. 334.
—— tingens, ii. 334.
—— triflorus, ii. 335.
—— tristis, ii. 335.
—— *unifarius*, ii. 329.
—— uniflorus, ii. 335.
—— velutinus, ii. 335.
—— virescens, ii. 335.
—— viridiflorus, ii. 335.
Gonzalagunia, ii. 31.
GONZALEA, ii. 31.

Gonzalea nivea, ii. 32.
—— panamensis, ii. 32.
—— parviflora, ii. 32.
—— secunda, ii. 32.
—— spicata, ii. 32.
GOODENOVIEÆ, ii. 263.
Goodenovieæ, iv. 184, 205, 217.
GOODYERA, ii. 303.
Goodyera striata, iii. 303.
GORDONIA, i. 97.
Gordonia lasianthus, i. 98.
—— *parviflora*, i. 98; ii. 301.
GORDONIEÆ, i. 96.
GOSSYPIANTHUS, iii. 17.
Gossypianthus lanuginosus, iii. 15.
—— rigidiflorus, iii. 17; iv. 82.
GOSSYPIUM, i. 123.
Gossypium barbadense, i. 123.
Gothofreda cordifolia, ii. 321.
GOUANIA, i. 201.
Gouania blanchetiana, i. 202.
—— corylifolia, i. 202.
—— domingensis, i. 202.
—— *glabra*, i. 202.
—— stipularis, i. 202.
—— tomentosa, i. 202.
GOUANIEÆ, i. 201.
Gouinia polygama, iii. 581.
GOVENIA, iii. 249.
Govenia, iv. 149, 233, 268, 269.
Govenia alba, iii. 249.
—— andrieuxii, iii. 249.
—— *andrieuxii*, iv. 269.
—— brevilabris, iii. 249.
—— capitata, iii. 250.
—— *capitata*, iv. 304.
—— deliciosa, iii. 250.
—— *fasciata*, iii. 250.
—— *lagenophora*, iii. 250.
—— liliacea, iii. 250.
—— *liliacea*, iv. 295.
—— mutica, iii. 250.
—— pauciflora, iii. 250.
—— quadriplicata, iii. 250.
—— *speciosa*, iv. 148.
—— *spicata*, iv. 305.
—— superba, iii. 250.
—— *superba*, iv. 304, 305.
—— utriculata, iii. 250.
GRAMINEÆ, iii. 475; iv. 94, 109.
Gramineæ, iv. 199, 202, 215, 217, 226, 232, 234, 278.
GRAMMITIDEÆ, iii. 672.
Grammitis, iv. 148.
—— *elongata*, iii. 661.
—— marginellus, iii. 663.
—— *serrulata*, iii. 669.
GRAPHEPHORUM, iii. 580.
Graphephorum altijugum, iii. 580.
—— *altijugum*, iv. 297.
—— *psilosantha*, iii. 580.
GREENELLA, iv. 51.
Greenella arizonica, iv. 51.
—— discoidea, iv. 51.
GREGGIA, i. 38.
Greggia camporum, i. 38.
—— *camporum*, iv. 141.
—— *purpurea*, i. 374.
—— *rupestris*, i. 374.
Grewia mexicana, i. 136.
GREWIEÆ, i. 136.
GRIAS, i. 414.
Grias fendleri, i. 414.
Grimmia, iv. 150, 151.
GRINDELIA, ii. 112.
Grindelia angustifolia, ii. 112.
—— arguta, ii. 112.
—— arizonica, iv. 52.
—— *coronopifolia*, ii. 110.
—— costata, iv. 52.
—— *dunalii*, ii. 112.
—— *duvalii*, ii. 112.
—— glutinosa, ii. 112.
—— inuloides, ii. 112.
—— *inuloides*, iv. 288.
—— lamberti, ii. 113.
—— subdecurrens, ii. 113.
Grindeliopsis gymnospermoides, ii. 111.
GRONOVIA, i. 471.
Gronovia, iv. 119, 150.
Gronovia scandens, i. 471.
Guaco mexicana, iii. 41; iv. 84.
GUADUA, iii. 587.
Guadua, iv. 280.
Guadua aculeata, iii. 587.
—— amplexifolia, iii. 587.
—— flabellata, iii. 588.
—— *flabellata*, iv. 297.
—— inermis, iii. 588.
—— intermedia, iii. 588.
—— latifolia, iii. 588.
GUAIACUM, i. 159.
Guaiacum coulteri, i. 159.
—— guatemalense, i. 159.
—— parvifolium, i. 159.
—— *sloanei*, i. 159.
—— verticale, i. 159.
GUARDIOLA, ii. 144.
Guardiola atriplicifolia, ii. 144.
—— mexicana, ii. 144.
—— platyphylla, ii. 144.
—— tulocarpus, ii. 144.
GUAREA, i. 181.
Guarea, iv. 230.
—— *aubletii*, i. 182.
—— bijuga, i. 181.
—— *bijuga*, i. 182.
—— brachystachya, i. 181.
—— *excelsa*, i. 182.
—— filiformis, i. 181.
—— fulva, i. 181.
—— hirsuta, i. 181.
—— hoffmanniana, i. 182.
—— humilis, i. 182.
—— kegelii, i. 182.
—— *kegelii*, i. 181.
—— mexicana, i. 181.
—— pallida, i. 181.
—— trichilioides, i. 182.
GUATTERIA, i. 15.
Guatteria amplifolia, i. 15.
—— bibracteata, i. 15.
—— diospyroides, i. 16.
—— galeottiana, i. 16.
—— jurgensenii, i. 16.
—— *longipes*, i. 16.
—— macrantha, i. 16.
—— *macropus*, i. 16.
—— schomburgkiana, i. 16.
GUAZUMA, i. 133.
Guazuma polybotrya, i. 133; iv. 15.
—— tomentosa, i. 133; iv. 97.
—— ulmifolia, i. 134.
GUETTARDA, ii. 41.
Guettarda armata, ii. 43.
—— conferta, ii. 41.
—— dealbata, ii. 41.
—— dichotoma, ii. 41.
—— odorata, ii. 41.
—— parviflora, ii. 41.
—— *prostrata*, ii. 42.
—— ramuliflora, ii. 42.
—— scabra, ii. 42.
—— *speciosa*, iv. 233.
—— viscosa, ii. 42.
GUETTARDEÆ, ii. 41.
Guilandina bonducella, i. 324.
GUILLEMINEA, iii. 15.
Guilleminea densa, iii. 15.
—— illecebroides, iii. 15.
—— *illecebrum*, iii. 15.
—— lanuginosa, iii. 15.
Gulielma utilis, iii. 413.
GUNNERA, i. 401.
Gunnera insignis, i. 401.
—— *insignis*, iv. 157.
Günthera viscosa, ii. 111.
GURANIA, i. 485.
Gurania coccinea, i. 485.

Gurania costaricensis, i. 485.
—— levyana, i. 485.
—— makoyana, i. 485.
—— seemanniana, i. 485.
—— wageneriana, i. 485.
GUSTAVIA, i. 413.
Gustavia angustifolia, i. 413.
—— *insignis*, i. 413.
—— latifolia, i. 413.
—— salviniæ, i. 413.
—— *speciosa*, i. 413.
—— superba, i. 413.
Guthnickia atrosanguinea, ii. 474.
—— *foliosa*, ii. 474.
—— *mimuliflora*, ii. 473.
GUTIERREZIA, ii. 111.
Gutierrezia, iv. 51.
—— *alamani*, ii. 109.
—— berlandieri, ii. 111.
—— coulteri, ii. 111.
—— euthamiæ, ii. 112.
—— glutinosa, ii. 112.
—— *gymnospermoides*, ii. 111.
—— microcephala, ii. 112; iv. 52.
—— sphærocephala, ii. 112.
—— texana, ii. 112.
—— wrightii, ii. 112.
GUTTIFERÆ, i. 85; iv. 97.
Guttiferæ, iv. 174, 203, 216, 230.
Gyas florida, iii. 214.
—— *verecunda*, iii. 215.
Gymnacanthus campestris, ii. 504.
—— *geminiflorus*, ii. 505.
—— *schlechtendalianus*, ii. 507.
Gymnadenia neottioides, iv. 90.
—— *propinqua*, iv. 90.
Gymnalypha jacquini, iii. 129.
GYMNANTHES, iii. 136.
Gymnanthes actinostemoides, iii. 136.
—— longipes, iii. 137.
—— riparia, iii. 137.
—— *schlechtendaliana*, iii. 137.
—— *treculiana*, iii. 136.
Gymnocalycinum reductum, i. 531, 545.
GYMNOCORONIS, ii. 79.
Gymnocoronis latifolia, ii. 79.
GYMNOGRAMME, iii. 676.
Gymnogramme asplenoides, iii. 676.
—— calomelanos, iii. 676; iv. 114.
—— *calomelanos*, iii. 679.
—— chærophylla, iii. 676.
—— *cheilosorus*, iii. 676.
Gymnogramme dealbata, iii. 673, 679.
—— diplazioides, iii. 676.
—— ehrenbergiana, iii. 677.
—— elongata, iii. 677.
—— ferruginea, iii. 677; iv. 116.
—— flexuosa, iii. 677.
—— *hispida*, iii. 677.
—— leptophylla, iii. 677.
—— *linkiana*, iii. 676.
—— mexicana, iii. 678.
—— *microcarpa*, iii. 656.
—— *nivea*, iii. 674.
—— *palmata*, iii. 682.
—— *pedata*, iii. 677.
—— pedata, iii. 678.
—— *peruviana*, iii. 676.
—— pilosa, iii. 678.
—— *pilosa*, iv. 298.
—— *podophylla*, iii. 677.
—— *polypodioides*, iii. 657, 676.
—— *procurrens*, iii. 678.
—— pumila, iii. 678.
—— *retrofracta*, iii. 677.
—— rufa, iii. 678.
—— *rupestris*, iii. 676.
—— *salvinii*, iii. 678.
—— *sinuata*, iii. 675.
—— tartarea, iii. 679.
—— trifoliata, iii. 679; iv. 116.
—— *totla*, iii. 676.
GYMNOLOMIA, ii. 161.
Gymnolomia cinerascens, ii. 161.
—— *encelioides*, iv. 57.
—— ensifolia, ii. 161.
—— flava, ii. 161.
—— ghiesbreghtii, ii. 162.
—— greggii, ii. 162.
—— latibracteata, ii. 162.
—— microcephala, ii. 162.
—— multiflora, ii. 162.
—— parkinsonii, ii. 163.
—— patens, ii. 163.
—— pinnatilobata, ii. 163.
—— rudbeckioides, ii. 163.
—— squarrosa, ii. 163.
—— subflexuosa, ii. 163.
—— tenuifolia, ii. 163.
GYMNOPOGON, iii. 560.
Gymnopogon longifolius, iii. 560.
—— virletii, iii. 560.
Gymnopsis, ii. 161.
—— *costaricensis*, ii. 163.
—— *dentata*, ii. 164.
—— *divaricata*, ii. 164.
—— *microcephala*, ii. 171.
Gymnopsis schiedeana, ii. 164.
—— *uniserialis*, ii. 164.
—— *vulcanica*, ii. 163.
Gymnopteris aliena, iii. 683.
—— *hastata*, iii. 683.
—— *irregularis*, iii. 683.
—— *portoricensis*, iii. 683.
GYMNOSPERMA, ii. 109.
Gymnosperma corymbosum, ii. 109.
—— eriocarpum, ii. 109.
—— multiflorum, ii. 109.
—— *oppositifolium*, iv. 59.
—— scoparium, ii. 109.
GYMNOSPERMEÆ, iii. 182.
Gymnospermæ, iv. 208, 209, 218, 219, 227.
Gymnosporia, i. 188.
Gymnostillingia acutifolia, iii. 135.
—— *macrantha*, iii. 135.
Gymnostomum, iv. 148.
Gymnotheca laxa, iii. 696.
Gymnothrix, iii. 509.
—— *bambusiformis*, iii. 507.
—— *complanata*, iii. 507.
—— *crinita*, iii. 508, 509.
—— *distachya*, iii. 509.
—— *grisebachiana*, iii. 508.
—— *mexicana*, iii. 508.
—— *nervosa*, iii. 508.
—— *tristachya*, iii. 509.
Gynamblosis maritima, iii. 114.
GYNANDROPSIS, i. 42.
Gynandropsis grandiflora, iv. 7.
—— speciosa, i. 43; iv. 7.
Gyneria sagittata, iii. 571.
GYNERIUM, iii. 570.
Gynerium saccharoides, iii. 571.
Gynoxys berlandieri, ii. 236.
—— *cumingii*, ii. 237.
—— *fragrans*, ii. 247.
—— *hænkei*, ii. 242.
Gyrandra chironioides, ii. 346.
—— *speciosa*, ii. 346.
GYROCARPEÆ, i. 405.
GYROCARPUS, i. 405.
Gyrocarpus americanus, i. 405.
—— gærtneri, i. 405.
—— humboldtii, i. 405.
—— jacquini, i. 405.
—— schiedei, i. 405.

HABENARIA, iii. 304.
Habenaria, iv. 269, 271.
—— *acutiflora*, iv. 90, 304, 305.

Habenaria adenantha, iv. 90, 303.
—— *alata*, iv. 90.
—— *brevilabiata*, iv. 90.
—— buccalis, iii. 305.
—— clypeata, iii. 305.
—— crassicornis, iii. 305.
—— diffusa, iii. 305.
—— *diffusa*, iv. 301.
—— entomantha, iii. 305.
—— flexuosa, iii. 305.
—— ghiesbreghtiana, iii. 305.
—— lactiflora, iii. 305.
—— *lactiflora*, iv. 301, 303.
—— leucostachys, iii. 305.
—— *leucostachys*, iv. 269.
—— limosa, iii. 305.
—— *macroceras*, iii. 305.
—— macroceratitis, iii. 305.
—— maxillaris, iii. 306.
—— novemfida, iii. 306.
—— odontopetala, iii. 306.
—— œrstedii, iii. 306.
—— *orizabensis*, iv. 90.
—— petalodes, iii. 306.
—— *petalodes*, var. *micrantha*, iii. 306.
—— *prasina*, iv. 304, 305.
—— *pyramidalis*, iii. 306.
—— repens, iii. 306.
—— *repens*, iv. 269.
—— setifera, iii. 306.
—— spathacea, iii. 306.
—— *spathacea*, iv. 301.
—— *stricta*, iv. 90.
—— strictissima, iii. 306.
—— triptera, iii. 306.
—— *virens*, iv. 90.
—— vulcanica, iii. 306.
—— *vulcanica*, iv. 295.
HABRACANTHUS, ii. 513.
Habracanthus hæmatodes, ii. 514.
—— sylvaticus, ii. 514.
Habranthus concolor, iii. 332.
Habrothamnus, ii. 430.
—— *aurantiacus*, ii. 433.
—— *aureus*, iv. 76.
—— *corymbosus*, ii. 431.
—— *elegans*, ii. 431.
—— *fasciculatus*, ii. 431, 432.
—— *hügelii*, ii. 431.
—— *paniculatus*, ii. 433.
—— *purpureus*, ii. 431.
—— *tomentosus*, ii. 430.
Hæmadictyon contortum, ii. 311.
—— *glabratum*, ii. 311.
—— macrocarpum, ii. 311.
—— *schizadenium*, ii. 312.
HÆMATOXYLON, i. 326.
Hæmatoxylon campechianum, i. 326.
—— *campechianum*, iv. 143.
HÆMODORACEÆ, iii. 324.
Hæmodoraceæ, iv. 196, 205, 217.
HALENIA, ii. 351.
Halenia, iv. 229.
Halenia alata, ii. 351.
—— *alata*, iv. 290.
—— *apiculata*, ii. 351, 352.
—— decumbens, ii. 351.
—— *decumbens*, ii. 352; iv. 290.
—— elongata, ii. 352.
—— gracilis, ii. 352.
—— *gracilis*, iv. 290.
—— latifolia, ii. 352.
—— longicornu, ii. 352.
—— *longicornu*, iv. 290.
—— multiflora, ii. 352.
—— *multiflora*, iv. 290.
—— nudicaulis, ii. 352.
—— *nudicaulis*, iv. 290.
—— nutans, ii. 352.
—— *nutans*, iv. 290.
—— parviflora, ii. 352.
—— paucifolia, ii. 352.
—— *paucifolia*, iv. 291.
—— plantaginea, ii. 352.
—— rothrockii, ii. 353; iv. 71.
—— schiedeana, ii. 353.
HALORAGEÆ, i. 400; iv. 35.
Halorageæ, iv. 179, 204, 217, 225.
Haloschænus capillaris, iii. 467.
—— *caracasanus*, iii. 467.
—— *pygmæus*, iii. 466.
—— *sparsus*, iii. 466.
Halostachys occidentalis, iii. 26.
Hamalium alatum, ii. 187.
HAMAMELIDEÆ, i. 400.
Hamamelideæ, iv. 179, 205, 241.
HAMELIA, ii. 34.
Hamelia chrysantha, ii. 34.
—— *grandiflora*, ii. 34.
—— lanuginosa, ii. 34.
—— nodosa, ii. 34.
—— patens, ii. 34; iv. 101, 112, 156.
—— quinifolia, ii. 34.
—— rostrata, ii. 34.
—— ventricosa, ii. 34.
—— xorullensis, ii. 35.
HAMELIEÆ, ii. 34.
HAMPEA, i. 126.
Hampea, iv. 237.
Hampea integerrima, i. 126.
HANBURIA, i. 488.
Hanburia mexicana, i. 488.
—— *mexicana*, iv. 245.
HANSTEINIA, ii. 515.
Hansteinia gracilis, ii. 515.
Hapalanthus repens, iii. 395.
HAPLOESTHES, ii. 234.
Haploesthes greggii, ii. 234; iv. 63.
HAPLOPAPPUS, ii. 114.
Haplopappus gracilis, ii. 114.
—— phyllocephalus, ii. 114.
—— ramulosus, ii. 114.
—— spinulosus, ii. 114.
—— stoloniferus, ii. 115.
—— *stoloniferus*, iv. 288.
HAPLOPHYTON, ii. 313.
Haplophyton cimicidum, ii. 313.
Haplostylis armeriæflora, iii. 465.
—— *barbata*, iii. 465.
—— *mexicana*, iii. 466.
Hargasseria cestrifolia, iii. 79.
—— *mexicana*, iii. 79.
—— *salicifolia*, iii. 79.
—— *schiedeana*, iii. 79.
HARPAGONELLA, ii. 376.
Harpagonella, iv. 256.
Harpagonella palmeri, ii. 377.
Harpalium mexicanum, ii. 180.
HARPALYCE, i. 252.
Harpalyce, i. 255.
Harpalyce arborescens, i. 252.
—— formosa, i. 252.
HARTWEGIA, iii. 223.
Hartwegia angustifolia, iii. 224.
—— gemma, iii. 223.
—— purpurea, iii. 223.
HASSELTIA, i. 141.
Hasseltia floribunda, i. 142.
—— *pubescens*, i. 142.
—— pyramidalis, i. 142.
HAUYA, i. 462; iv. 37.
Hauya, iv. 244.
Hauya barcenæ, i. 462.
—— *barcenæ*, i. 463.
—— cornuta, i. 462.
—— elegans, i. 463.
—— *elegans*, i. 462.
HEBANTHE, iii. 19.
Hebanthe, iv. 82.
Hebanthe hookeriana, iii. 19.
—— mollis, iii. 20.
—— palmeri, iv. 82.
—— *pulverulenta*, iii. 19.
—— subnuda, iii. 20.
Hebeclinium ehrenbergii, ii. 94.
—— *ianthinum*, ii. 96.
—— *liebmannii*, ii. 96.
—— *macrocephalum*, ii. 94.
—— *macrophyllum*, ii. 97.
—— *tepicanum*, ii. 101.

HECHTIA, iii. 317.
Hechtia argentea, iii. 317.
—— *argentea*, iii. 318.
—— cordylinoides, iii. 318.
—— ghiesbreghtii, iii. 318.
—— *ghiesbreghtii*, iii. 317.
—— glomerata, iii. 318.
—— schottii, iii. 318.
—— stenopetala, iii. 318.
Hecistopteris pumila, iii. 678.
Heckeria peltata, iii. 53.
—— *umbellata*, iii. 56.
Hectorea, ii. 113.
—— *viscosissima*, ii. 114.
HECUBÆA, ii. 211.
Hecubæa scorzoneræfolia, ii. 211.
HEDEOMA, ii. 547.
Hedeoma costata, ii. 547.
—— dentata, ii. 548.
—— drummondii, ii. 548.
—— hyssopifolia, ii. 548.
—— *hyssopifolia*, ii. 550.
—— *incana*, ii. 549.
—— *mollis*, ii. 550.
—— palmeri, ii. 548.
—— *palmeri*, ii. 549.
—— piperita, ii. 548.
—— rotundifolia, ii. 549.
—— tenella, ii. 549.
Hedera alaris, i. 572.
—— *arborea*, i. 572.
—— *capitata*, i. 573.
—— *xalapensis*, i. 574.
HEDWIGIA, i. 180; iv. 21.
Hedwigia balsamifera, i. 180.
—— *balsamifera*, iv. 21.
—— mexicana, i. 180.
—— panamensis, iv. 21.
HEDYOSMUM, iii. 66.
Hedyosmum artocarpus, iii. 66.
—— calloso-serratum, iii. 66.
—— *calloso-serratum*, iv. 159, 293.
—— mexicanum, iii. 66.
HEDYOTIDEÆ, ii. 28.
Hedyotis acerosa, ii. 31.
—— *bouvardioides*, ii. 30.
—— *cærulea*, ii. 30.
—— *halei*, ii. 29.
—— *herbacea*, ii. 29.
—— *humifusa*, ii. 30.
—— *stenophylla*, ii. 29.
HEDYSAREÆ, i. 267.
Hedysarum angustifolium, i. 275.
—— *cinereum*, i. 277.
—— *glabrum*, i. 279.
—— *molliculum*, i. 283.
HEERIA, i. 416.
Heeria axillaris, i. 416.
—— *cupheoides*, i. 418.
—— elegans, i. 416.
—— macrostachya, i. 416.
—— rosea, i. 416.
—— subtriplinervis, i. 417.
—— *subtriplinervis*, iv. 242.
Heimia, i. 448.
—— *salicifolia*, i. 448.
Heinzelia longiflora, ii. 521.
HELENIOIDEÆ, ii. 209.
Helenioideæ, iv. 183.
HELENIUM, ii. 227.
Helenium amphibolum, i. 227.
—— *heterophyllum*, ii. 227.
—— hoopesii, ii. 227.
—— integrifolium, ii. 227.
—— laciniatum, ii. 227.
—— mexicanum, ii. 227.
—— microcephalum, ii. 227.
—— ooclinium, ii. 227; iv. 62.
—— puberulum, ii. 227.
—— quadridentatum, ii. 228.
—— *scorzoneræfolium*, var. *ghiesbreghtii*, ii. 211.
—— varium, ii. 228.
HELEOCHARIS, iii. 454.
Heleocharis acicularis, iii. 454.
—— arenicola, iii. 454.
—— calyptrata, iii. 455.
—— cancellata, iii. 455.
—— capitata, iii. 455.
—— chætaria, iii. 455.
—— densa, iii. 455.
—— *depauperata*, iii. 455.
—— dombeyana, iii. 455.
—— *fistulosa*, iii. 456.
—— geniculata, iii. 456.
—— *geniculata*, iii. 455.
—— liebmanniana, iii. 456.
—— *montana*, iii. 455, 456.
—— *mutata*, iii. 456.
—— nana, iii. 456.
—— nodulosa, iii. 456.
—— ovata, iii. 456.
—— *palustris*, iii. 456.
—— radicans, iii. 456.
—— *radicans*, iv. 296.
—— reptans, iii. 456.
—— schaffneri, iv. 93.
—— spiralis, iii. 456.
—— stolonifera, iii. 457.
—— sulcata, iii. 457.
—— *trichoides*, iii. 455.
—— triflorus, iii. 457.
—— *truncata*, iii. 455, 456.
Heliamphora, i. 26.
HELIANTHELLA, ii. 185.
Helianthella mexicana, ii. 185, iv. 57.
HELIANTHEMUM, i. 47.
Helianthemum, iv. 235.
Helianthemum arenicola, i. 47.
—— *arenicola*, iv. 8.
—— argenteum, i. 47; iv. 8.
—— astylum, i. 47.
—— canadense, i. 47.
—— *canadense*, i. 48.
—— coulteri, iv. 8.
—— glomeratum, i. 47.
—— *glomeratum*, i. 48.
—— obcordatum, i. 48.
—— patens, i. 48; iv. 8.
—— *polifolium*, i. 47.
—— *tripetalum*, i. 46.
HELIANTHOIDEÆ, ii. 139.
Helianthoideæ, iv. 183.
HELIANTHUS, ii. 179.
Helianthus amplexicaulis, ii. 179.
—— *amplexicaulis*, iv. 57.
—— annuus, iv. 56.
—— *buddleiæformis*, ii. 177.
—— cernuus, ii. 179; iv. 56.
—— ciliaris, ii. 179; iv. 56.
—— cornifolius, ii. 179.
—— *cornifolius*, iv. 288.
—— *dentatus*, ii. 177.
—— *excelsus*, ii. 177.
—— *giganteus*, ii. 177.
—— laciniatus, ii. 179.
—— laurifolius, ii. 179.
—— *lenticularis*, iv. 56.
—— *linearis*, ii. 178.
—— longeradiatus, ii. 180.
—— mexicanus, ii. 180.
—— micranthus, ii. 180.
—— *micranthus*, iv. 288.
—— occidentalis, ii. 180.
—— ovatus, ii. 180.
—— *parviflorus*, ii. 180.
—— præcox, ii. 180.
—— quinqueradiatus, ii. 180.
—— *rugosus*, ii. 178.
—— *speciosus*, ii. 176.
—— *squarrosus*, ii. 178.
—— tephrodes, iv. 57.
—— *tetrapterus*, ii. 186.
—— trilobatus, ii. 180.
—— *tubæformis*, ii. 177.
Helichrysum lavandulifolium, iv. 150.
Helicia, iii. 77.
HELICONIA, iii. 312.
Heliconia, iv. 166.
Heliconia bihai, iii. 312.

Heliconia hirsuta, iii. 313.
—— psittacorum, iii. 313.
—— rostrata, iv. 90.
—— vaginalis, iii. 313.
HELICTEREÆ, i. 127.
HELICTERES, i. 128.
Helicteres altheæfolia, i. 128.
—— baruensis, i. 128.
—— *carpinifolia*, i. 128.
—— guazumæfolia, i. 128.
—— jamaicensis, i. 128.
—— *mexicana*, i. 128.
—— mollis, i. 128.
Helietta, iv. 17.
Helietta parvifolia, iv. 17.
HELIOCARPUS, i. 139.
Heliocarpus americanus, i. 139.
—— appendiculatus, i. 139.
—— arborescens, i. 139.
—— popayanensis, i. 139; iv. 15.
—— tomentosus, i. 139.
Heliogenes, ii. 156.
—— *longifolia*, ii. 157.
Heliomeris, ii. 161.
—— *multiflora*, ii. 162.
—— *tenuifolia*, ii. 163.
Heliophytum glabriusculum, ii. 375.
—— *macrostachyum*, ii. 375.
—— *parviflorum*, ii. 376.
HELIOPSIS, ii. 155.
Heliopsis, ii. 156.
Heliopsis annua, ii. 156.
—— buphthalmoides, ii. 156.
—— *canescens*, ii. 156.
—— parvifolia, ii. 156; iv. 55.
—— procumbens, ii. 156.
HELIOTROPIUM, ii. 374.
Heliotropium americanum, ii. 374.
—— angustifolium, ii. 374.
—— campechianum, ii. 374.
—— *canescens*, ii. 375.
—— *cinereum*, ii. 375.
—— confertifolium, ii. 374.
—— convolvulaceum, ii. 374.
—— coriaceum, ii. 374.
—— corymbosum, ii. 374.
—— curassavicum, ii. 374.
—— filiforme, ii. 375.
—— fruticosum, ii. 375.
—— glabriusculum, ii. 375.
—— greggii, ii. 375.
—— indicum, ii. 375; iv. 113.
—— inundatum, ii. 375; iv. 105.
—— limbatum, ii. 375.
—— *limbatum*, ii. 374.
—— —— *confertifolium*, ii. 374.
—— macrostachyum, ii. 375.
Heliotropium oaxacanum, ii. 376.
—— oblongifolium, ii. 376.
—— palmeri, iv. 72.
—— parviflorum, ii. 376; iv. 105.
—— phyllostachyum, ii. 376.
—— *procumbens*, ii. 375.
—— rigidulum, ii. 376.
—— rugosum, ii. 376.
—— rupestre, ii. 376.
—— *rupestre*, ii. 375.
—— striatum, ii. 376.
HELLEBOREÆ, i. 8.
Helleborine americana, iii. 215.
Helleria livida, iii. 582.
Helmia convolvulacea, iii. 355.
—— *ehrenbergiana*, iii. 360.
—— *racemosa*, iii. 359.
Helminthostachys, iii. 697.
Helonias officinalis, iii. 383.
—— *virescens*, iii. 382.
Helopus, iii. 483.
—— *acuminatus*, iii. 484.
—— *punctatus*, iii. 484.
Helosciadium leptophyllum, i. 566.
HELOSIS, iii. 88.
Helosis mexicana, iii. 88.
HEMARTHRIA, iii. 521.
Hemarthria compressa, iii. 522.
—— fasciculata, iii. 522.
HEMEROCALLEÆ, iii. 369.
Hemerocallis, iii. 369.
Hemiachyris glutinosa, ii. 112.
HEMICARPHA, iii. 463.
Hemicarpha drummondii, iii. 463.
—— subsquarrosa, iii. 463.
HEMICHÆNA, ii. 448.
Hemichæna fruticosa, ii. 448.
Hemichroma schaffneri, ii. 462.
Hemidictyum marginatum, iii. 636.
Hemigraphis elegans, ii. 506.
Hemimeris mutisii, ii. 440.
—— *parviflora*, ii. 440.
HEMIONITIS, iii. 682.
Hemionitis citrifolia, iii. 682.
—— *dealbata*, iii. 679.
—— hederæfolia, iii. 682.
—— levyi, iii. 682.
—— palmata, iii. 682.
—— pinnatifida, iii. 683.
—— *rufa*, iii. 678.
Hemiphlebium kraussii, iii. 602.
HEMIPHYLACUS, iii. 376.
Hemiphylacus latifolius, iii. 376.
Hemiptilium bigelovii, ii. 262.
—— *schottii*, ii. 262.
Hemisandra aurantiaca, ii. 512.
Hemistegia decurrens, iii. 592.
Hemistegia elegans, iii. 592.
—— *elegantissima*, iii. 592.
—— *lucida*, iii. 592.
—— *mexicana*, iii. 593.
—— *willdenowii*, iii. 592.
HEMITELIA, iii. 592.
Hemitelia, iv. 281.
Hemitelia apiculata, iii. 592.
—— costaricensis, iii. 592.
—— decurrens, iii. 592.
—— hartii, iv. 95.
—— horrida, iv. 115.
—— mexicana, iii. 593.
—— nigricans, iii. 593.
—— *obscura*, iii. 593.
—— petiolata, iii. 593.
—— subincisa, iii. 593.
Hendecandra maritima, iii. 114.
—— *multiflora*, iii. 117.
—— *texensis*, iii. 117.
Henlea, ii. 14.
HENRIETTELLA, i. 432.
Henriettella seemannii, i. 432.
HENRIQUEZIEÆ, ii. 14.
Henrya barclayana, ii. 526.
—— *insularis*, ii. 526.
—— *scorpioides*, ii. 526.
HERMANNIA, i. 129.
Hermannia, iv. 230, 237.
Hermannia inflata, iv. 15.
—— texana, i. 130; iv. 15.
HERMANNIEÆ, i. 129.
Hermesia mexicana, iii. 121.
Hernandia sonora, iii. 77.
HERPESTIS, ii. 451.
Herpestis callitrichoides, ii. 453.
—— chamædryoides, ii. 451; iv. 76, 105.
—— *chrysantha*, ii. 451.
—— *colubrina*, ii. 451.
—— monniera, ii. 451; iv. 105.
—— *moranensis*, ii. 451.
—— nigrescens, ii. 451.
—— *nigrescens*, iv. 76.
—— panamensis, ii. 452.
—— pilosa, ii. 452.
—— radiata, ii. 452.
—— ramosa, ii. 452.
—— ranaria, ii. 452.
—— repens, ii. 452.
—— salzmanni, ii. 452.
—— sessiliflora, ii. 452.
—— *tomentosa*, ii. 450.
HERRANIA, i. 133.
Herrania albiflora, i. 133.
Hesperanthes leptophylla, iii. 375.
—— *scabrella*, iii. 375.

Hesperanthes stenocarpa, iii. 375.
—— *torreyi*, iii. 375.
Heterandra reniforme, iii. 385.
HETERANTHERA, iii. 384.
Heteranthera, iv. 231.
—— *acuta*, iii. 385.
—— *alismoides*, iii. 385.
—— graminea, iii. 384.
—— limosa, iii. 384.
—— mexicana, iii. 385.
—— peduncularis, iii. 385.
—— *pubescens*, iii. 385.
—— reniformis, iii. 385.
—— *reniformis*, var. *multiflora*, iii. 385.
Heterocentron mexicanum, i. 417.
Heterocentrum glandulosum, i. 416.
—— *mexicanum*, i. 416.
—— *roseum*, i. 416.
Heterochæta pubescens, ii. 125.
Heterochlamys quinquenervia, iii. 118.
Heteroloma lamprocarpa, i. 280.
—— leptoclada, i. 281.
—— macrostachya, i. 282.
—— orizabana, i. 284.
—— scutata, i. 287.
—— skinneri, i. 288.
HETEROMERÆ, ii. 271.
Heteromeris mexicana, i. 47.
Heteroneuron paradoxum, iii. 671.
—— *serratifolium*, iii. 689.
Heteronoma diversifolium, i. 417.
—— *galeottianum*, i. 417.
Heterophlebium grandifolium, iii. 623.
Heteropleura, ii. 259.
—— *crepidisperma*, ii. 259.
HETEROPOGON, iii. 524.
Heteropogon acuminatus, iii. 524.
—— contortus, iii. 524.
—— *contortus*, iv. 94.
—— firmus, iii. 524; iv. 94.
—— *glaber*, iii. 524.
—— *hirtus*, iii. 524.
—— *scrobiculatus*, iii. 524.
—— *secundus*, iii. 523.
—— *stipoides*, iii. 523.
HETEROPTERYS, i. 150.
Heteropterys, iv. 230.
—— *argentea*, i. 152.
—— beecheyana, i. 150.
—— cotinifolia, i. 150.
—— *cotinifolia*, i. 151.
—— floribunda, i. 150.
—— gayana, i. 150.
—— laurifolia, i. 150.
—— *lessertiana*, i. 150.
Heteropterys lindeniana, i. 151.
—— longifolia, i. 151.
—— mathewsiana, i. 151.
—— platyptera, i. 151.
—— stannea, i. 151.
—— *tomentosa*, i. 150.
Heterosperma, ii. 195.
HETEROSPERMUM, ii. 195.
Heterospermum dicranocarpum, ii. 144.
—— pinnatum, ii. 195.
Heterostega juncifolia, iii. 561.
Heterotaxis crassifolia, iii. 265.
HETEROTHECA, ii. 113.
Heterotheca chrysopsidis, ii. 113.
—— inuloides, ii. 113.
—— lamarckii, iv. 52.
—— leptoglossa, ii. 113.
—— *scabra*, iv. 52.
HETEROTOMA, ii. 269.
Heterotoma, iv. 253.
Heterotoma arabidoides, ii. 269.
—— intermedia, ii. 269.
—— lobelioides, ii. 270; iv. 66.
—— *lobelioides*, iv. 289.
—— macrocentron, ii. 270.
—— tenella, ii. 270.
HETEROTRICHUM, i. 430.
Heterotrichum octonum, i. 430; iv. 36.
HEUCHERA, i. 381.
Heuchera, iv. 240.
Heuchera longipetala, i. 381.
—— *longipetala*, i. 382.
—— minutiflora, i. 382.
—— orizabensis, i. 382.
—— *orizabensis*, iv. 285.
—— rubescens, i. 383.
—— sanguinea, i. 383.
HEXADESMIA, iii. 220.
Hexadesmia, iii. 221.
Hexadesmia bifida, iii. 220.
—— brachyphylla, iii. 220.
—— crurigera, iii. 220; iv. 89.
—— *crurigera*, iii. 220; iv. 294.
—— fasciculata, iii. 220.
—— *lindeniana*, iii. 220.
—— lurida, iii. 220.
—— micrantha, iii. 220.
—— rhodoglossa, iii. 221.
—— sessilis, iii. 221.
—— stenotepala, iii. 221.
HEXALECTRIS, iii. 213.
Hexalectris, iv. 269.
Hexalectris aphylla, iii. 213.
—— *aphylla*, iv. 269.
Hexarrhena cenchroides, iii. 516.
HEXASEPALUM, ii. 61.
Hexasepalum angustifolium, ii. 61.
HEXISEA, iii. 218.
Hexisea bidentata, iii. 219.
—— oppositifolia, iii. 219.
Hexopia crurigera, iii. 220.
Heyfeldera, ii. 113.
—— *sericea*, ii. 114.
HIBISCEÆ, i. 120.
HIBISCUS, i. 120.
Hibiscus, iv. 144.
Hibiscus abelmoschus, i. 120.
—— *abelmoschus*, i. 121.
—— acetosæfolius, i. 121.
—— achanioides, i. 121.
—— azanzæ, i. 121.
—— berlandierianus, i. 121.
—— *betulifolius*, i. 122.
—— *betulinus*, i. 122.
—— bifurcatus, i. 121.
—— bracteosus, i. 121.
—— cardiophyllus, i. 121.
—— coulteri, i. 121.
—— cruentus, i. 121.
—— cyanogynus, i. 121.
—— denudatus, i. 121.
—— diodon, iv. 14.
—— elatus, i. 121.
—— fasciculatus, i. 121.
—— lavateroides, i. 121.
—— marmoratus, i. 122.
—— oxyphyllus, i. 122.
—— phœniceus, i. 122.
—— spathulatus, i. 122.
—— spiralis, i. 122.
—— tampicensis, i. 122.
—— tiliaceus, i. 122; iv. 111.
—— tubiflorus, i. 122.
—— uncinellus, i. 122.
—— *unilateralis*, i. 122.
HIDALGOA, ii. 198.
Hidalgoa lessingii, ii. 198.
—— ternata, ii. 198.
HIERACIUM, ii. 259.
Hieracium, iv. 150.
Hieracium abscissum, ii. 259.
—— *abscissum*, iv. 149.
—— anthurum, ii. 259.
—— *anthurum*, iv. 289.
—— carneum, iv. 65.
—— comatum, ii. 259.
—— crepidispermum, ii. 259; iv. 65.
—— *crepidispermum*, iv. 289.
—— *friesii*, ii. 260.
—— *irasuense*, ii. 259; iv. 158.
—— junceum, ii. 259.

Hieracium lagopus, ii. 259.
—— *lagopus*, iv. 289.
—— lemmoni, iv. 65.
—— mexicanum, ii. 260.
—— ——, var. niveopappum, iv. 65.
—— *mexicanum*, iv. 149, 289.
—— niveopappum, ii. 260.
—— *niveopappum*, iv. 289.
—— præmorsiforme, ii. 260.
—— *præmorsiforme*, iv. 289.
—— pringlei, iv. 65.
—— schultzii, ii. 260.
—— strigosum, ii. 260.
—— stuposum, ii. 260.
—— thyrsoideum, ii. 260.
—— *thyrsoideum*, iv. 289.
—— *tridentatum*, ii. 129.
HIEROCHLOE, iii. 532.
Hierochloe, iii. 531.
Hierochloe mexicana, iii. 532.
—— *mexicana*, iv. 296.
Hieronia, i. 11.
HIERONYMA, iii. 105.
Hieronyma alchorneoides, iii. 105.
—— benthami, ii. 105.
—— oblonga, iii. 105.
Higginsia, ii. 35.
—— *discolor*, ii. 36.
—— *ghiesbreghtii*, ii. 36.
—— *mexicana*, ii. 37.
—— *psychotriæfolia*, ii. 37; iv. 157.
—— *refulgens*, ii. 37.
—— *regalis*, ii. 37.
HILARIA, iii. 516.
Hilaria, iv. 280.
Hilaria cenchroides, iii. 516.
Hillebrandia, iv. 245.
HIMANTOSTEMMA, iv. 70.
Himantostemma pringlei, iv. 70.
HIPPEASTRUM, iii. 334.
Hippeastrum concolor, iii. 332.
—— equestre, iii. 334; iv. 108.
Hippia minuta, ii. 230.
HIPPOCRATEA, i. 193.
Hippocratea acapulcensis, i. 193.
—— acutiflora, i. 193.
—— celastroides, i. 193.
—— *discolor*, i. 194.
—— elliptica, i. 193.
—— excelsa, i. 193.
—— integrifolia, i. 193.
—— *mexicana*, i. 194.
—— obcordata, i. 193.
—— ovata, i. 193.
—— *scandens*, i. 193.
—— serrulata, i. 194.
Hippocratea tenella, iv. 98.
—— uniflora, i. 194.
—— versicolor, i. 194.
HIPPOCRATEÆ, i. 192.
Hippodamia insignis, ii. 481.
HIPPOMANE, iii. 134.
Hippomane biglandulosa, iii. 136.
—— mancinella, iii. 134.
—— *mancinella*, iv. 165.
Hippuris vulgaris, ii. 400.
HIRÆA, i. 154.
Hiræa acuminata, i. 156.
—— barclayana, i. 154; iv. 97.
—— chrysophylla, i. 154.
—— *cycloptera*, i. 156.
—— greggii, iv. 16.
—— lilacina, iv. 16.
—— *macroptera*, i. 155.
—— manzinellensis, i. 154.
—— *mucronata*, i. 156.
—— *oxyota*, ii. 157.
—— *panamensis*, i. 154.
—— *podocarpa*, i. 157.
—— polybotrya, i. 155.
—— *reclinata*, iv. 111.
—— septentrionalis, i. 155.
—— sericea, i. 155.
—— spicigera, i. 155.
—— swartziana, i. 155.
HIRÆEÆ, i. 153.
HIRTELLA, i. 366.
Hirtella acayacensis, i. 366.
—— americana, i. 366; iv. 112.
—— castanea, i. 366.
—— dodecandra, i. 366.
—— mollissima, i. 366.
—— oblongifolia, i. 366.
—— *polyandra*, i. 367.
—— racemosa, i. 367.
—— *racemosa*, iv. 166.
—— triandra, i. 367.
Hisingera celastrinea, i. 57.
—— cinerea, i. 57.
—— elliptica, i. 57.
—— flexuosa, i. 57.
—— *intermedia*, i. 57.
—— lanceolata, i. 57.
—— *mexicana*, i. 57.
—— *nitida*, i. 57.
—— panamensis, i. 57.
—— *puberula*, i. 57.
—— seemanni, i. 57.
Hodgkinsonia, ii. 43.
HOFFMANNIA, ii. 35.
Hoffmannia, iv. 249.
Hoffmannia affinis, ii. 35.
—— cauliflora, ii. 35.
Hoffmannia discolor, ii. 36.
—— ghiesbreghtii, ii. 36.
—— lenticellata, ii. 36.
—— *lenticellata*, ii. 35.
—— longepetiolata, ii. 36.
—— macrophylla, ii. 37.
—— mexicana, ii. 37.
—— psychotriæfolia, ii. 37.
—— refulgens, ii. 37.
—— regalis, ii. 37.
—— strigillosa, ii. 37.
Hoffmannseggia, iv. 240.
HOFFMANSEGGIA, i. 325.
Hoffmanseggia, iv. 230.
Hoffmanseggia densiflora, i. 325.
—— drummondii, i. 325.
—— gladiata, i. 326.
—— gracilis, iv. 31.
—— humilis, i. 326.
—— melanosticta, i. 326.
—— oxycarpa, i. 326.
—— platycarpa, i. 326.
—— stricta, i. 326; iv. 31.
Hohenbergia laxiflora, iii. 314.
Hoitzia, ii. 356.
—— *amplectens*, ii. 356.
—— *aristata*, ii. 356.
—— *cærulea*, ii. 356.
—— *capitata*, ii. 356.
—— *cervantesii*, ii. 356.
—— *coccinea*, ii. 356.
—— *conglomerata*, ii. 356.
—— *elata*, ii. 356.
—— *glandulosa*, ii. 356.
—— *lupulina*, ii. 357.
—— *mexicana*, ii. 356.
—— *nepetæfolia*, ii. 356.
—— *spicata*, ii. 356.
HOLACANTHA, i. 173.
Holacantha emoryi, i. 173.
HOLOGRAPHIS, ii. 513.
Holographis ehrenbergiana, ii. 513.
Holosteum mucronatum, i. 76.
HOMALIEÆ, i. 471.
HOMALIUM, i. 471.
Homalium racemosum, i. 471; iv. 38.
—— senarium, i. 471.
HOMALOMENA, iii. 424.
Homalomena, iv. 229.
Homalomena wendlandii, iii. 425.
Hopkirkia anthemoides, ii. 212.
Hoppia, iii. 468.
—— *microcephala*, iii. 468.
HORDEÆ, iii. 584.
HORDEUM, iii. 585.
Hordeum jubatum, iii. 585.

Hordeum jubatum, iv. 279.
—— adscendens, iii. 585.
HORMIDIUM, iii. 218.
Hormidium miserum, iii. 218.
—— pulchellum, iii. 218.
—— pygmæum, iii. 218.
Hormium caulescens, ii. 551.
HOSACKIA, i. 233.
Hosackia, iv. 239.
Hosackia angustifolia, i. 233.
—— brachycarpa, i. 234.
—— *elata*, i. 234.
—— *floribunda*, i. 234.
—— *mexicana*, i. 233.
—— *mollis*, i. 234.
—— nana, i. 234.
—— *pilosa*, i. 234.
—— puberula, i. 234.
—— purshiana, i. 234.
—— rigida, i. 234.
Hosta grandiflora, ii. 539.
—— *grandifolia*, ii. 539.
—— *latifolia*, ii. 539.
—— *longifolia*, ii. 539.
HOULETTIA, iii. 259.
Houlettia lansbergii, iii. 259.
HOUSTONIA, ii. 29.
Houstonia, iv. 47, 249.
Houstonia acerosa, iv. 47.
—— angustifolia, ii. 29; iv. 47.
—— ——, var. scabra, iv. 47.
—— bouvardioides, ii. 30.
—— cærulea, ii. 30.
—— *chlorantha*, ii. 7.
—— *coccinea*, ii. 10.
—— fasciculata, iv. 47.
—— humifusa, ii. 30.
—— longiflora, ii. 30.
—— palmeri, iv. 47.
—— purpurea, ii. 30.
—— rubra, ii. 30.
—— triflora, ii. 30.
HOUTTUYNIA, iii. 44.
Houttuynia, iv. 229, 259.
Houttuynia californica, ii. 45.
HOVERDENIA, ii. 522.
Hoverdenia speciosa, ii. 522.
Howardia, ii. 15.
—— *benthamii*, iii. 42.
—— *caracasensis*, ii. 15.
—— *costaricensis*, iii. 41.
—— dolosum, iii. 608.
—— *fœtida*, iii. 42.
—— *grandiflora*, iii. 42.
—— *hoffmannii*, iii. 43.
—— *macradenia*, iii. 42.
Hudsonia, iv. 235.
Hufelandia pendula, iii. 70.
—— *thomæa*, iii. 70.
Humboldtia purpurea, iii. 199.
Humiriaceæ, i. 145; iv. 175.
Humulus lupulus, iii. 140.
HUNNEMANNIA, i. 27.
Hunnemannia fumariæfolia, i. 27.
HUNNEMANNIEÆ, i. 27.
Huntleya cerina, iii. 251.
HURA, iii. 137.
Hura crepitans, iii. 137.
—— poliandra, iii. 137.
HYBANTHUS, i. 53.
Hybanthus havanensis, i. 53.
—— mexicanus, i. 53.
HYDRANGEA, i. 383.
Hydrangea, iv. 144, 229, 241.
Hydrangea peruviana, i. 383.
HYDRANGEÆ, i. 383.
HYDRANTHELIUM, ii. 453.
Hydranthelium, iv. 231.
Hydranthelium egense, ii. 453.
—— *egense*, iv. 231.
Hydrocera, i. 166.
HYDROCHARIDEÆ, iii. 196.
Hydrocharideæ, iv. 195, 205, 217.
HYDROCOTYLE, i. 557.
Hydrocotyle, i. 558.
Hydrocotyle bonariensis, i. 557.
—— bonplandii, i. 557.
—— *grumosa*, i. 558.
—— interrupta, i. 557.
—— *interrupta*, iv. 45.
—— *leucocephala*, i. 557.
—— mexicana, i. 557.
—— *mexicana*, iv. 149.
—— *natans*, i. 558.
—— prolifera, i. 558; iv. 45.
—— pusilla, i. 558.
—— *racemosa*, i. 557.
—— ranunculoides, i. 558.
HYDROCOTYLEÆ, i. 557.
Hydroglossum mexicanum, iii. 695.
—— *spectabile*, iii. 695.
HYDROLEA, ii. 365.
Hydrolea, iv. 355.
—— *dichotoma*, ii. 364.
—— glabra, ii. 365.
—— *nigricaulis*, iv. 255.
Hydromestus maculatus, ii. 512.
Hydropeltis, i. 24.
—— *purpurea*, i. 24.
—— spinosa, ii. 365.
—— *urens*, ii. 360.
HYDROPHYLLACEÆ, ii. 358; iv. 71.
Hydrophyllaceæ, iv. 187, 203, 217, 225, 255.
Hydrostachyon brevirostre, iii. 428.
—— *cochlearispathum*, iii. 428.
—— *longirostre*, iii. 428.
Hydrotænia ehrenbergii, iv. 90.
—— *meleagris*, iv. 90.
HYGROPHILA, ii. 501.
Hygrophila costata, ii. 501.
—— lacustris, ii. 501.
—— longifolia, ii. 502.
—— rivularis, ii. 502.
—— *salicifolia*, ii. 501.
Hymenachne fluviatilis, iii. 498.
—— *frondescens*, iii. 496.
—— *gouini*, iii. 492.
—— *leptostachya*, iii. 490.
—— *myosurus*, iii. 492.
—— *patula*, iii. 492.
—— *phleiformis*, iii. 494.
HYMENÆA, i. 341.
Hymenæa candolleana, i. 341.
—— courbaril, i. 341.
HYMENATHERUM, ii. 220.
Hymenatherum, iv. 140, 252.
Hymenatherum acerosum, ii. 220.
—— *acerosum*, iv. 141.
—— *bœberoides*, iv. 61.
—— berlandieri, ii. 220.
—— *berlandieri*, iv. 61.
—— bœberoides, ii. 220.
—— diffusum, ii. 220.
—— *gnaphalodes*, ii. 220.
—— gnaphalopsis, ii. 220.
—— hartwegii, ii. 220.
—— næi, ii. 220; iv. 61.
—— pentachætum, ii. 220; iv. 61.
—— serratifolium, ii. 221.
—— tenuifolium, ii. 221.
—— *tenuifolium*, iv. 61.
—— tenuilobum, iv. 61.
—— *tenuilobum*, ii. 221.
—— thurberi, iv. 61.
HYMENELLA, i. 71.
Hymenella, iv. 236.
Hymenella mœhringioides, i. 71.
HYMENOCALLIS, iii. 335.
Hymenocallis acutifolia, iii. 335.
—— adnata, iii. 335.
—— bistubata, iii. 335.
—— choretis, iii. 335.
—— *dillenii*, iii. 336.
—— glauca, iii. 335.
—— harrisiana, iii. 335.
—— insignis, iii. 335.
—— *lacera*, iii. 335.
—— *littoralis*, δ. *acutifolia*, iii. 335.

Hymenocallis paludosa, iii. 336.
—— panamensis, iii. 335.
—— repanda, iii. 335.
—— rotata, iii. 335.
—— skinneriana, iii. 336.
—— staplesiana, iii. 335.
HYMENOCLEA, ii. 150.
Hymenoclea monogyra, ii. 150.
Hymenodium crinitum, iii. 685.
Hymenolobus, i. 39.
Hymenolobus mexicanus, i. 39.
—— *pubens*, iv. 6.
HYMENOPAPPUS, ii. 211.
Hymenopappus flavescens, ii. 211; iv. 58.
—— mexicanus, iv. 58.
—— *pedatus*, ii. 214.
HYMENOPHYLLEÆ, iii. 597.
HYMENOPHYLLUM, iii. 597.
Hymenophyllum, iii. 601.
—— *abruptum*, iii. 598.
—— asplenioides, iii. 598.
—— axillare, iii. 598.
—— *baueri*, iii. 598.
—— *botryoides*, iii. 600.
—— brevifrons, iii. 598.
—— brevistipes, iii. 598.
—— *bulnesianum*, iii. 599.
—— ciliatum, iii. 598; iv. 115.
—— ——, var. splendidum, iii. 598.
—— *ciliatum*, iii. 599.
—— *commutatum*, iii. 598.
—— crispum, iii. 598.
—— cruentum, iii. 601.
—— *elegans*, iii. 599.
—— flaccidum, iii. 598.
—— *frazeri*, iii. 598.
—— fucoides, iii. 599.
—— *fucoides*, iii. 600.
—— ——, var. *frigidum*, iii. 600.
—— hirsutum, iii. 599.
—— hirtellum, iii. 599.
—— interruptum, iii. 599.
—— *jalapense*, iii. 600.
—— lineare, iii. 599.
—— *macrocarpon*, iii. 598.
—— microcarpum, iii. 600.
—— millefolium, iii. 601.
—— myriocarpum, iii. 600; iv. 115.
—— *nigrescens*, iii. 600.
—— *organense*, iii. 600.
—— pectinatum, iii. 601.
—— *pedicellatum*, iii. 599.
—— *plumosum*, iii. 600.
—— polyanthos, iii. 600; iv. 115.
—— *protrusum*, iii. 600.
Hymenophyllum pulchellum, iii. 600.
—— *schiedeanum*, iii. 598.
—— sericeum, iii. 600.
—— *splendidum*, iii. 598.
—— *trapezoidale*, iii. 598, 599.
—— *trifidum*, iii. 599.
—— tunbridgense, β. wilsoni, iii. 600.
—— *tunbridgense*, iii. 600.
—— *undulatum*, iii. 599.
—— valvatum, iii. 601.
HYMENOSTEPHIUM, ii. 194.
Hymenostephium mexicanum, ii. 195.
Hymenothecium, iii. 516.
—— *quinquesetum*, iii. 516, 517.
—— *trisetum*, iii. 517.
—— *unisetum*, iii. 517.
HYMENOTHRIX, ii. 213.
Hymenothrix wislizenii, ii. 213.
—— wrightii, ii. 213.
HYMENOXYS, ii. 228.
Hymenoxys chrysanthemoides, ii. 229.
—— *odorata*, ii. 228.
Hyoscyamus albus, ii. 434.
Hyospathe, iv. 277.
Hypaelyptum sphacelatum, iii. 464.
Hyparrhenia foliosa, iii. 526.
—— *ruprechtii*, iii. 529.
HYPERBÆNA, i. 22.
Hyperbæna mexicana, i. 22.
HYPERICINEÆ, i. 82; iv. 12.
Hypericineæ, iv. 174, 204, 224, 230.
HYPERICUM, i. 82.
Hypericum, iv. 147, 149, 159, 163.
—— *brathys*, iv. 159.
—— canadense, i. 82.
—— collinum, i. 82.
—— denticulatum, i. 82.
—— *euphorbioides*, i. 83.
—— fastigiatum, i. 83.
—— formosum, i. 83.
—— gnidioides, i. 83.
—— mexicanum, i. 83.
—— moranense, i. 83.
—— *moranense*, i. 82; iv. 283.
—— mutilum, i. 83.
—— *mutisianum*, i. 83.
—— paniculatum, i. 83.
—— pauciflorum, i. 83.
—— *pauciflorum*, i. 82; iv. 283.
—— philonotis, i. 83.
—— pratense, i. 83.
—— *pratense*, iv. 283.
Hypericum quinquenervium, i. 83.
—— schaffneri, iv. 12.
—— scouleri, i. 84.
—— *stellarioides*, i. 83.
—— *thesiifolium*, i. 82.
Hypnum, iv. 148, 149.
—— *delicatulum*, iv. 149.
—— *tamariscinum*, iv. 149.
Hypochæris, iv. 149, 150.
HYPOCYRTA, ii. 487.
—— nummularia, ii. 487.
HYPODERRIS, iii. 595.
Hypoderris, iv. 280.
—— *adnata*, iii. 595.
—— *marginalis*, iii. 595.
—— seemanni, iii. 595.
Hypoelytrum sphacelatum, iii. 464.
HYPOLEPIS, iii. 612.
Hypolepis californica, iii. 612.
—— hostilis, iii. 612.
—— *mexicana*, iii. 613.
—— parallelogramma, iii. 612.
—— *radiata*, iii. 616.
—— repens, iii. 613; iv. 116.
HYPOLYTRUM, iii. 464.
Hypolytrum nicaraguense, iii. 464.
HYPOPITHYS, ii. 285.
Hypopithys, iv. 229.
—— *lanuginosa*, ii. 285.
—— multiflora, ii. 285.
Hypopogon brevipes, i. 98; ii. 301.
Hypoporum hirtellum, iii. 469.
—— *micrococcum*, iii. 470.
—— *nutans*, iii. 469.
—— *purpurascens*, iii. 469.
—— *verticillatum*, iii. 471.
Hypopterygium adstringens, i. 223.
HYPOXIS, iii. 331.
Hypoxis breviscapa, iii. 332.
—— decumbens, iii. 331.
—— *elongata*, iii. 332.
—— *gracilis*, iii. 332.
—— *humilis*, iii. 332.
—— *mexicana*, iii. 331.
—— *pusilla*, iii. 332.
HYPTIS, ii. 542.
Hyptis, iv. 213, 258.
Hyptis albida, ii. 542.
—— *aspera*, ii. 544.
—— atrorubens, ii. 542.
—— brevipes, ii. 542.
—— capitata, ii. 542.
—— *capitata*, iv. 233.
—— emoryi, ii. 543.
—— excelsa, ii. 543.
—— ferruginea, ii. 543.
—— involucrata, ii. 543.

Hyptis lantanæfolia, ii. 543.
—— lilacina, ii. 543.
—— macrocephala, ii. 543.
—— moçiniana, ii. 543.
—— nicaraguensis, ii. 543.
—— *nitida*, ii. 562.
—— oblongifolia, ii. 543.
—— odorata, ii. 543.
—— parkeri, ii. 543.
—— *parviflora*, ii. 545.
—— pectinata, ii. 544; iv. 113.
—— *pectinata*, iv. 231.
—— polystachya, ii. 544.
—— *procumbens*, ii. 542.
—— pubescens, ii. 544.
—— pulegioides, ii. 544.
—— radiata, ii. 544.
—— recurvata, ii. 544.
—— rhomboidea, ii. 544.
—— rhytidea, ii. 544.
—— sinclairi, ii. 545.
—— spicata, ii. 544.
—— spicigera, ii. 545.
—— spinulosa, ii. 545.
—— stellulata, ii. 545.
—— suaveolens, ii. 545.
—— tomentosa, ii. 545.
—— umbrosa, ii. 545.
—— urticoides, ii. 545.
—— verticillata, ii. 545.
—— viejensis, ii. 546.
—— vulcanica, ii. 546.

Ibatia, ii. 330, 335.
Ibidium crystalligerum, iii. 302.
—— *speciosum*, iii. 300.
ICHNANTHUS, iii. 500.
Ichnanthus alsinoides, iii. 500.
—— mexicanus, iii. 500.
—— nemorosus, iii. 500.
—— pallens, iii. 500; iv. 114.
ICICA, i. 178.
Icica, i. 177.
Icica copal, i. 178.
—— leptostachya, i. 178.
—— serrata, i. 178.
ILEX, i. 186.
Ilex, iv. 309.
Ilex bumelioides, i. 186.
—— condensata, i. 187.
—— discolor, i. 187.
—— mexicana, i. 187.
—— occidentalis, i. 187.
—— tolucana, i. 187.
ILICINEÆ, i. 186.
Ilicineæ, iv. 177, 204.
ILLAIREA, i. 473.
Illairea canarinoides, i. 473.
ILLECEBRACEÆ, iii. 9; iv. 82.
Illecebraceæ, iv. 190, 204, 217.
Illecebrum densum, iii. 15.
—— *vermiculatum*, iii. 18.
ILYSANTHES, ii. 453.
Ilysanthes gratioloides, ii. 453.
IMPATIENS, i. 166.
IMPERATA, iii. 519.
Imperata arundinacea, iii. 519.
—— ——, var. *americana*, iii. 519.
—— brasiliensis, iii. 519.
—— *brasiliensis*, var. *mexicana*, iii. 519.
—— caudata, iii. 519.
Incompletæ, iv. 208, 209, 218, 219, 227.
INDIGOFERA, i. 250.
Indigofera, iv. 239.
Indigofera acutifolia, i. 250.
—— anil, i. 250; iv. 111.
—— coronilloides, i. 250.
—— costa-ricensis, i. 250.
—— densiflora, i. 250.
—— *densiflora*, iv. 284.
—— domingensis, i. 250.
—— excelsa, i. 251.
—— *excelsa*, iv. 284.
—— hippocrepoides, i. 251.
—— leptocephala, i. 251.
—— lespedezioides, i. 251.
—— lindheimeriana, iv. 27.
—— lotoides, i. 251.
—— mexicana, i. 251.
—— *microcarpa*, i. 250.
—— mucronata, i. 251; iv. 111.
—— ornithopodioides, i. 251.
—— pascuorum, i. 251.
—— polyphylla, i. 250.
—— sphærocarpa, i. 252.
—— subulata, i. 252.
—— thibaudiana, i. 252.
—— *torulosa*, i. 251.
INFERÆ, ii. 1.
INGA, i. 361.
Inga, iv. 163, 213.
—— *anomala*, i. 357.
—— billbergiana, i. 361.
—— *canescens*, i. 356.
—— *cognata*, i. 359.
—— coriacea, i. 361.
—— *coriacea*, i. 357.
—— *corymbifera*, i. 363.
—— edulis, i. 362.
—— elegans, i. 362.
Inga emarginata, i. 357.
—— eriocarpa, i. 362.
—— flexuosa, i. 362.
—— *flexuosa*, i. 364.
—— *foliosa*, i. 364.
—— *fulgens*, i. 364.
—— globulifera, i. 362.
—— *guatemalensis*, i. 348.
—— *harrisii*, i. 357.
—— hayesii, i. 362.
—— *hirsuta*, i. 358.
—— *houstoni*, i. 358.
—— *humboldtiana*, i. 363.
—— ingoides, i. 362.
—— insignis, i. 362.
—— jinicuil, i. 362.
—— lævigata, i. 362.
—— laurina, i. 362.
—— leptoloba, i. 363.
—— lindeniana, i. 363.
—— *macrophylla*, i. 363.
—— marginata, i. 363.
—— *meissneriana*, iv. 112.
—— membranacea, i. 363.
—— multijuga, i. 363.
—— nitens, i. 363.
—— nobilis, i. 363.
—— œrstediana, i. 363.
—— *ornata*, i. 362.
—— *pachycarpa*, i. 362.
—— panamensis, i. 363, 364.
—— *patens*, i. 343.
—— *pennatula*, i. 354.
—— portobellensis, i. 363.
—— punctata, i. 364.
—— *riedeliana*, i. 363.
—— rufescens, i. 364.
—— ruiziana, i. 364.
—— *schiedeana*, i. 362.
—— *semicordata*, i. 358.
—— *sericantha*, i. 363.
—— sericea, i. 364.
—— *speciosa*, i. 357.
—— spectabilis, i. 364.
—— spuria, i. 364.
—— *tetraphylla*, i. 359.
—— tubulifera, i. 364.
—— vera, i. 364.
—— villosa, i. 364.
—— xalapensis, i. 364.
—— *xalapensis*, i. 362.
INGEÆ, i. 355.
INGENHOUSIA, i. 123.
Ingenhousia, iv. 237.
Ingenhousia triloba, i. 123.
INULOIDEÆ, ii. 132.
Inuloideæ, iv. 183.

Iodanthus pinnatifidus, i. 31.
IONIDIUM, i. 52.
Ionidium botterii, i. 52.
—— calceolarium, i. 52.
—— elatum, i. 52.
—— galeottii, iv. 8.
—— gracile, i. 52.
—— lasiocarpum, i. 52.
—— *linarifolium*, i. 53.
—— lineare, i. 52.
—— lobeliodes, i. 52.
—— longifolium, i. 52.
—— occultum, i. 52.
—— *parietariæfolium*, i. 53.
—— polygalæfolium, i. 52.
—— riparium, i. 53.
—— strictum, i. 53.
—— verbenaceum, i. 53.
IONOPSIS, iii. 290.
Ionopsis brevifolia, iii. 290.
—— *tenera*, iii. 290.
—— utricularioides, iii. 290; iv. 270.
—— *zonalis*, iii. 290.
IOSTEPHANE, ii. 168.
Iostephane heterophylla, ii. 168.
—— trilobata, ii. 169.
IPOMŒA, ii. 383.
Ipomœa, ii. 387; iv. 110, 144, 147, 212, 256.
Ipomœa acetosæfolia, iv. 113.
—— *acetosæfolia*, ii. 385.
—— acuminata, ii. 383.
—— *acuminata*, iv. 113.
—— affinis, ii. 383.
—— alatipes, ii. 383.
—— ampliata, ii. 383.
—— apiculata, ii. 383.
—— arborescens, ii. 383.
—— *arborescens*, iv. 143, 256.
—— aristulata, ii. 383.
—— *armata*, ii. 384.
—— asarifolia, ii. 383.
—— *asarifolia*, iv. 231.
—— batatas, ii. 384.
—— *batatoides*, ii. 390.
—— *biloba*, ii. 392.
—— bombycina, ii. 384.
—— bona-nox, ii. 384; iv. 105.
—— brachypoda, ii. 384.
—— bracteata, ii. 384.
—— brevipes, ii. 384.
—— capillacea, ii. 384.
—— cardiophylla, iv. 73.
—— carnosa, ii. 385.
—— *carnosa*, ii. 384.
—— cathartica, ii. 385.
Ipomœa chenopodifolia, ii. 385.
—— cissoides, ii. 385.
—— coccinea, ii. 385; iv. 113.
—— *coccinea*, ii. 387.
—— commutata, ii. 386; iv. 73.
—— corralinensis, ii. 386.
—— costellata, ii. 386; iv. 73.
—— cuneifolia, iv. 73.
—— dealbata, ii. 386.
—— delphinifolia, ii. 386.
—— deppeana, ii. 386.
—— digitata, ii. 386.
—— dubia, ii. 386.
—— *dubia*, ii. 385.
—— elongata, ii. 386.
—— emetica, ii. 386.
—— *eustachiana*, ii. 395.
—— fastigiata, ii. 387; iv. 113.
—— *fastigiata*, ii. 384.
—— fistulosa, ii. 387.
—— funis, ii. 387.
—— glabra, ii. 387.
—— *globosa*, ii. 391.
—— hartwegi, ii. 387.
—— *hartwegi*, ii. 391, 392.
—— *hastigera*, ii. 387.
—— hederacea, ii. 387.
—— hederifolia, ii. 387.
—— *hederifolia*, ii. 390.
—— heterophylla, ii. 388; iv. 73.
—— *heterophylla*, ii. 389.
—— hirta, ii. 388.
—— hirtiflora, ii. 388.
—— *hookeri*, ii. 393.
—— *humboldtiana*, ii. 387.
—— *insignis*, ii. 386.
—— jalapa, ii. 388.
—— *jalapa*, ii. 393.
—— jamaicensis, ii. 388; iv. 105, 113.
—— karwinskiana, ii. 388.
—— latifolia, ii. 388.
—— learii, ii. 388.
—— lemmoni, iv. 73.
—— leptotoma, ii. 388.
—— lilacina, ii. 389.
—— lindenii, ii. 389.
—— lindheimeri, ii. 389.
—— llaveana, ii. 389.
—— *llaveana*, ii. 387, 392.
—— longepedunculata, ii. 389.
—— longicuspis, ii. 389.
—— longifolia, ii. 389.
—— lutea, ii. 389.
—— *luteola*, ii. 385.
—— *macrantha*, ii. 390.
—— maireti, ii. 390.
Ipomœa maritima, ii. 392.
—— martinicensis, ii. 390.
—— *mauritiana*, ii. 386.
—— mestitlanica, ii. 390.
—— mexicana, ii. 390; iv. 73.
—— microsepala, ii. 390.
—— morelii, ii. 390.
—— *muricata*, ii. 384.
—— murucoides, ii. 390.
—— *murucoides*, ii. 383; iv. 256.
—— *mutabilis*, ii. 383.
—— *nil*, ii. 387.
—— ——, var. *diversifolia*, ii. 390.
—— nutans, ii. 391.
—— oblonga, ii. 391.
—— pandurata, ii. 391.
—— *paniculata*, ii. 386.
—— pauciflora, ii. 391.
—— pedatisecta, ii. 391.
—— pedicellaris, ii. 391.
—— peduncularis, ii. 391.
—— *peduncularis*, ii. 387, 389, 392.
—— pentaphylla, ii. 392.
—— perryana, ii. 392.
—— pes-capræ, ii. 392; iv. 105.
—— *pes-capræ*, iv. 162, 165.
—— *petiolaris*, ii. 384.
—— portobellensis, ii. 392.
—— proximum, ii. 392.
—— pterodes, ii. 392.
—— *pterodes*, ii. 383.
—— pubescens, ii. 392.
—— *pudibunda*, ii. 385.
—— puncticulata, ii. 392.
—— purga, ii. 393.
—— *purga*, iv. 148.
—— purpurea, ii. 393.
—— *purshii*, ii. 388.
—— quamoclit, ii. 393.
—— quinquefolia, ii. 393.
—— rubro-cærulea, ii. 393.
—— *sanguinea*, ii. 387.
—— schaffneri, iv. 73.
—— schiedeana, ii. 393.
—— serotina, ii. 393.
—— serpyllifolia, ii. 393.
—— setifera, ii. 394.
—— *shumardi*, ii. 389.
—— sidæfolia, ii. 394; iv. 113.
—— simulans, ii. 394.
—— *simulans*, iv. 291.
—— sinuata, ii. 394.
—— *spicata*, ii. 384.
—— stans, ii. 394.
—— stipulacea, ii. 394.
—— suaveolens, ii. 394.
—— suffulta, ii. 394.

Ipomœa sulphurea, ii. 386.
—— superba, ii. 394.
—— ternifolia, ii. 394.
—— thurberi, ii. 395; iv. 73.
—— trifida, ii. 395.
—— triloba, ii. 395; iv. 113.
—— tuberosa, ii. 395.
—— tubulosa, ii. 395.
—— tyrianthina, ii. 395.
—— umbellata, ii. 395; iv. 113.
—— *urbica*, ii. 383.
—— variabilis, ii. 395.
—— venustum, ii. 395.
—— versicolor, ii. 395; iv. 74.
—— wallii, ii. 396.
—— *willdenowii*, ii. 388.
—— wrightii, ii. 396.
Ipomopsis elegans, iv. 71.
—— *inconspicua*, ii. 355.
IRESINE, iii. 21.
Iresine, iv. 147.
Iresine acuminata, iii. 21.
—— *aggregata*, iii. 17.
—— canescens, iii. 21.
—— cassiniæformis, iii. 21; iv. 82.
—— celosioides, iii. 21; iv. 107, 114.
—— *celosioides*, var. *eriophylla*, iii. 21.
—— *diffusa*, iii. 21.
—— elatior, iii. 21.
—— *elongata*, iii. 22.
—— *eriophylla*, iii. 21.
—— *floribunda*, iii. 21.
—— frutescens, iii. 21.
—— gossypina, iii. 21.
—— gracilis, iii. 22.
—— hookeri, iii. 22.
—— interrupta, iii. 22.
—— latifolia, iii. 22.
—— *polymorpha*, iii. 21.
—— *vermicularis*, iii. 18.
Iriartea durissima, iii. 401.
—— *exorhiza*, iii. 401.
IRIDEÆ, iii. 325; iv. 90.
Irideæ, iv. 196, 203, 217, 226, 231, 234.
IRIS, iii. 325.
Iris martinicensis, iii. 326.
—— *missouriensis*, iii. 325.
Iroucana guianensis, i. 469.
ISACHNE, iii. 484.
Isachne, iii. 485.
—— *arundinacea*, iii. 484.
—— *disperma*, iii. 484, 485.
—— *dispersa*, iii. 484.
—— *dubia*, iii. 484.
Isachne panicea, iii. 484.
—— *polygonoides*, iii. 494.
—— *brachysperma*, iii. 484.
—— *ventricosa*, iii. 484.
ISATIDEÆ, i. 40.
Ischæmopogon latifolius, iii. 522.
ISCHÆMUM, iii. 522.
Ischæmum latifolium, iii. 522.
—— *leersioides*, iii. 528; iv. 279.
—— *pallidum*, iii. 515.
ISCHNOSIPHON, iii. 309.
Ischnosiphon pluripicatus, iii. 309.
ISERTIA, ii. 31.
Isertia hænkeana, ii. 31.
—— spicæformis, ii. 31.
Isnardia palustris, i. 452.
ISOCARPHA, ii. 166.
Isocarpha divaricata, ii. 167.
—— echioides, ii. 167.
—— *echioides*, ii. 81.
—— oppositifolia, ii. 167.
ISOCHILUS, iii. 222.
Isochilus, iv. 148.
Isochilus carnosiflorus, iii. 222.
—— *cernuum*, iii. 232.
—— crassiflorus, iii. 222.
—— *crassiflorus*, iv. 302.
—— *dubius*, iii. 219.
—— *elegans*, iii. 241.
—— *globosum*, iii. 231.
—— *graminifolium*, iii. 265, 266.
—— latibracteatus, iii. 222.
—— *latibracteatus*, iv. 302.
—— linearis, iii. 222.
—— *linearis*, iv. 270, 294, 303, 304.
—— *lividus*, iii. 219.
—— major, iii. 222.
—— *ramosum*, iii. 239.
Isoëtes, iii. 704; iv. 282.
Isolepis, iii. 462.
—— *asperula*, iii. 459.
—— *bufonia*, iii. 459.
—— *cæspitula*, iii. 463.
—— *capillaris*, iii. 459.
—— *corymbosa*, iii. 462.
—— cyperoides, iii. 461.
—— *echinulata*, iii. 462.
—— *hispida*, iii. 460.
—— *junciformis*, iii. 462; iv. 165.
—— *panamensis*, iii. 462.
—— *subsquarrosa*, iii. 463.
—— *vestita*, iii. 460.
ISOLOMA, ii. 477.
Isoloma, ii. 487.
Isoloma cordifolium, ii. 478.
—— costaricense, ii. 478.
—— deppeanum, ii. 478.
Isoloma elegans, ii. 478.
—— *hondense*, ii. 478.
—— ignoratum, ii. 478.
—— incanum, ii. 478.
—— incurvum, ii. 478.
—— linkianum, ii. 478.
—— longifolium, ii. 479.
—— petiolare, ii. 479.
—— pictum, ii. 479.
—— pilosum, ii. 479.
—— rupestre, ii. 479.
—— schiedeanum, ii. 479.
—— seemannii, ii. 479.
—— spicatum, ii. 479.
—— strictum, ii. 479.
—— tetragonum, ii. 480.
—— tubiflorum, ii. 480.
—— *warscewiczii*, ii. 478.
Isotoma longiflora, iv. 103.
Isotypus onoseroides, ii. 254.
IVA, ii. 149.
Iva ambrosiæfolia, iv. 55.
—— asperifolia, ii. 149.
—— dealbata, ii. 149; iv. 55.
Ixophorus schiedeanus, iii. 505.
—— *unisetus*, iii. 506.
IXORA, ii. 46.
Ixora americana, ii. 10.
—— ferrea, ii. 46.
—— floribunda, ii. 46.
—— *ternifolia*, ii. 10.
IXOREÆ, ii. 46.

JABOROSA, ii. 425.
Jaborosa longiflora, ii. 425.
JACARANDA, ii. 497.
Jacaranda copaia, ii. 497.
—— filicifolia, ii. 497.
JACARATIA, i. 482.
Jacaratia, iv. 245.
Jacaratia mexicana, i. 482.
JACOBINIA, ii. 519.
Jacobinia, ii. 521.
Jacobinia aschenborniana, ii. 520.
—— aurea, ii. 520.
—— chrysostephana, ii. 520.
—— *ciliata*, ii. 518.
—— ghiesbreghtiana, ii. 520.
—— heterophylla, ii. 520.
—— incana, ii. 521.
—— longiflora, ii. 521.
—— macrantha, ii. 521.
—— macrophylla, ii. 521.
—— mexicana, ii. 521.
—— mohintli, ii. 521.
—— neesiana, ii. 521.
—— nutans, ii. 521.

Jacobinia paniculata, ii. 522.
—— tinctoria, ii. 522.
—— virgata, ii. 522.
JACQUEMONTIA, ii. 396.
Jacquemontia, iv. 231.
—— *azurea*, ii. 396.
—— hirsuta, ii. 396.
—— lactescens, ii. 396.
—— nummularia, ii. 396.
—— oaxacana, ii. 396.
—— parviflora, ii. 396.
—— pentantha, iv. 113.
—— pycnocephala, ii. 396.
—— violacea, ii. 397; iv. 105.
JACQUINIA, ii. 294.
Jacquinia angustifolia, ii. 294.
—— aristata, iv. 104, 113.
—— armillaris, ii. 294.
—— axillaris, ii. 295.
—— caracasana, ii. 295; iv. 104.
—— macrocarpa, ii. 295.
—— pungens, ii. 295.
—— racemosa, ii. 295.
—— ruscifolia, ii. 295.
—— umbellata, ii. 295.
JÆGERIA, ii. 157.
Jægeria hirta, ii. 157.
—— *hirta*, iv. 58, 288.
—— macrocephala, ii. 158.
—— mnioides, ii. 158.
—— pedunculata, ii. 158.
Jalambicea repens, iii. 196.
Jaltomata edulis, ii. 422.
Jamesonia, iii. 672.
—— *adnata*, iii. 664.
Janipha æsculifolia, iii. 120.
—— *fœtida*, iii. 121.
—— *lœflingii*, iii. 121.
—— *manihot*, var. *angustiloba*, iii. 120.
—— *yuquilla*, iii. 121.
JANUSIA, i. 157.
Janusia gracilis, i. 157.
—— *gracilis*, iv. 140.
Jarava ichu, iii. 537.
Jasminum luteum, etc., ii. 338.
JATROPHA, iii. 105.
Jatropha, iv. 146, 260.
Jatropha aconitifolia, iii. 106.
—— *æsculifolia*, iii. 120.
—— alamani, iii. 106.
—— andrieuxii, iii. 106.
—— angustidens, iii. 106.
—— berlandieri, iii. 106.
—— canescens, iii. 106.
—— cardiophylla, iii. 106.
—— *carthagenensis*, iii. 120.
Jatropha cinerea, iii. 106.
—— cordata, iii. 106.
—— curcas, iii. 107.
—— elegans, iii. 107.
—— *fœtida*, iii. 121.
—— genuina, iii. 106, 108.
—— gossypiifolia, iii. 107.
—— *gossypiifolia*, iv. 231.
—— herbacea, iii. 109.
—— hernandiæfolia, iii. 107.
—— *janipha*, iii. 121.
—— kunthiana, iii. 107.
—— liebmanni, iii. 107.
—— macrorhiza, iii. 107.
—— marcgravii, iii. 109.
—— multifida, iii. 107.
—— multipartita, iii. 106.
—— olivacea, iii. 107.
—— palmata, iii. 106.
—— platyphylla, iii. 107.
—— podagrica, iii. 108.
—— pseudocurcas, iii. 108.
—— quinqueloba, iii. 108.
—— rotundifolia, iii. 108.
—— septemloba, iii. 108.
—— sessilifolia, iii. 108.
—— spatulata, iii. 108.
—— staphysagriæfolia, iii. 107.
—— stimulosa, iii. 109.
—— triloba, iii. 108.
—— tubulosa, iii. 108.
—— urens, iii. 108.
—— *urens*, iii. 107.
JAUMEA, ii. 290.
Jaumea, iv. 231, 252.
Jaumea mexicana, ii. 209.
—— peduncularis, ii. 209.
Jessenia, iv. 277.
JOHNSONIEÆ, iii. 376.
JOUVEA, iii. 567.
Jouvea, iv. 279.
Jouvea straminea, iv. 567.
JUANULLOA, ii. 429.
Juanulloa aurantiaca, ii. 429.
—— *aurantiaca*, ii. 430.
—— elliptica, ii. 429.
—— *hookeriana*, ii. 429.
—— mexicana, ii. 430.
—— panamensis, ii. 430.
—— *parasitica*, ii. 429, 430; iv. 262.
JUBELINA, i. 155.
Jubelina nicaraguensis, i. 155.
Juglandaceæ, iv. 205 217.
JUGLANDEÆ, iii. 162.
Juglandeæ, iv. 193, 226, 229.
JUGLANS, iii. 163.
Juglans, iv. 147.
—— *californica*, iii. 163.
—— *frutescens*, iii. 163.
—— mollis, iii. 163.
—— *nigra*, iii. 163.
—— *olivæformis*, iii. 163.
—— pyriformis, iii. 164.
—— rupestris, iii. 164.
—— *rupestris*, iv. 140, 141.
JULIANA, i. 223.
Juliana, i. 168.
Juliana adstringens, i. 223.
JULOCROTON, iii. 118.
Julocroton argenteus, iii. 118.
—— decalobus, iii. 118.
—— conspurcatus, iii. 118.
—— montevidensis, ε. guatemalensis, iii. 118.
—— quinquenervius, iii. 118.
—— *triqueter*, γ. *conspurcatus*, iii. iii. 118.
JUNCACEÆ, iii. 397.
Juncaceæ, iv. 197, 204, 226.
JUNCUS, iii. 397.
Juncus, iv. 150.
Juncus acuminatus, iii. 398.
—— balticus, iii. 398.
—— brevifolius, iii. 398.
—— bufonius, iii. 398.
—— *canaliculatus*, iii. 399.
—— *complanatus*, iii. 399.
—— *communis*, iii. 398.
—— *compressus*, iii. 399.
—— *conglomeratus*, iii. 398.
—— *debilis*, iii. 398.
—— *ebracteatus*, iii. 399.
—— effusus, iii. 398.
—— marginatus, iii. 399.
—— mexicanus, iii. 399.
—— *mexicanus*, iv. 296.
—— nodosus, iii. 399.
—— *orizabæ*, iii. 399.
—— *radicans*, iii. 398.
—— tenuis, iii. 399.
—— trinervia, iii. 399.
—— xiphioides, iii. 399.
Jungermannia, iv. 148.
Jungia altissima, ii. 561.
JUNIPERUS, iii. 184.
Juniperus, iv. 265.
—— *deppeana*, iii. 184.
—— flaccida, iii. 184.
—— *flaccida*, iv. 294.
—— *fœtida*, θ. *flaccida*, iii. 184.
—— *gigantea*, iii. 184.
—— mexicana, iii. 184.
—— *mexicana*, iv. 150, 294.

Juniperus pachyphlœa, iii. 184.
—— tetragona, iii. 184.
—— *tetragona*, iv. 144, 294.
—— virginiana, iii. 184.
Jurgensenia mexicana, ii. 282.
JUSSIÆA, i. 450.
Jussiæa affinis, i. 450.
—— alata, i. 450.
—— angustifolia, i. 450.
—— *angustifolia*, var. ?, i. 452.
—— calycina, i. 450.
—— erecta, iv. 112.
—— *erecta*, i. 451.
—— hirsuta, i. 450.
—— hirta, i. 450.
—— *ligustrifolia*, i. 451.
—— *macrocarpa*, i. 451.
—— nervosa, i. 450.
—— *occidentalis*, i. 451.
—— octofila, i. 450.
—— peploides, i. 451.
—— *persicariæfolia*, i. 451.
—— peruviana, i. 451.
—— polygonoides, i. 451.
—— repens, i. 451.
—— salicifolia, i. 451.
—— sedoides, i. 451.
—— suffruticosa, i. 451; iv. 112.
—— *swartziana*, i. 451.
—— tomentosa, i. 452.
—— venosa, i. 452.
—— *villosa*, i. 451.
Jussieua herbacea, iii. 109.
JUSTICIA, ii. 515.
Justicia, ii. 526.
—— *atramentaria*, ii. 521.
—— *barbata*, ii. 517.
—— *callistachya*, ii. 523.
—— *carthaginensis*, ii. 517.
—— *coccinea*, ii. 523.
—— *comata*, ii. 518.
—— *corymbulosa*, ii. 517.
—— *fulvicoma*, ii. 516.
—— furcata, ii. 515.
—— *ghiesbreghtiana*, ii. 520.
—— *hæmatodes*, ii. 514.
—— *heterophylla*, ii. 520.
—— *inæqualis*, ii. 518.
—— *macrantha*, ii. 521.
—— pacifica, ii. 515.
—— *parviflora*, ii. 506.
—— *quadrifida*, ii. 523.
—— *resupinata*, ii. 525.
—— rostrata, ii. 515.
—— salviæflora, ii. 515.
—— *scorpioides*, ii. 526.
—— *secunda*, ii. 519.
Justicia sexangularis, ii. 525.
—— *spicigera*, ii. 521.
—— *tubæformis*, ii. 524.
—— *umbrosa*, ii. 520.
—— *virgularis*, ii. 523.

Kallstrœmia grandiflora, i. 158; iv. 142.
—— *maxima*, i. 158.
KARATAS, iii. 313.
Karatas plumieri, iii. 313.
KARWINSKIA, i. 196.
Karwinskia affinis, i. 196.
—— glandulosa, i. 196.
—— humboldtiana, i. 196.
—— mollis, i. 197.
—— sessilifolia, i. 197.
—— subcordata, i. 197.
Kaulfussia, iii. 695.
Keerlia linearifolia, ii. 109.
—— *ramosa*, ii. 118.
Kefersteinia lacteum, iii. 251.
—— *stapelioides*, iii. 252.
Kegelia ruderalis, ii. 171.
Keithia marifolia, ii. 550.
Kellettia, i. 141.
—— *odorata*, i. 141.
Kerneria helianthoides, ii. 202.
Kingsboroughia alba, i. 216.
Kissenia, i. 204, 244, 471.
Kleinia colorata, ii. 216.
—— *jorullensis*, ii. 217.
—— *suffruticosa*, ii. 216, 217.
—— *tagetoides*, ii. 217.
—— *viridiflora*, ii. 217.
KLUGIA, ii. 489.
Klugia, iv. 229.
Klugia azurea, ii. 489.
Kniphofia, iii. 369.
KNOXIEÆ, ii. 43.
KŒBERLINIA, i. 175.
Kœberlinia spinosa, i. 175.
—— *spinosa*, iv. 140, 141.
Kœlera avenacea, iii. 568.
KŒLLIKERIA, ii. 477.
Kœllikeria argyrostigma, ii. 477.
Kœnigia, iv. 259.
Körnickia lanata, ii. 475.
Kohleria ignorata, ii. 478.
—— *incana*, ii. 478.
—— *linkiana*, ii. 478.
—— *longifolia*, ii. 479.
—— *rupestris*, ii. 479.
—— *schiedeana*, ii. 479.
—— *seemanni*, ii. 479.
—— *spicata*, ii. 479.
—— *tetragona*, ii. 480.
Kohleria tubiflora, ii. 480.
KOSTELETZKEYA, i. 120.
Kosteletzkeya, iv. 230.
—— *asterocarpa*, i. 120.
—— cordata, i. 120.
—— coulteri, i. 120.
—— hastata, i. 120; iv. 14.
—— hispida, i. 120.
—— paniculata, i. 130.
—— pentasperma, i. 120.
—— sagittata, i. 120.
Kowalewskia integerrima, ii. 284.
—— *serrulata*, ii. 284.
KRAMERIA, i. 64.
Krameria, iv. 141.
—— *beyrichii*, i. 64.
—— canescens, iv. 9.
—— cinerea, i. 64.
—— *cinerea*, iv. 9.
—— cuspidata, i. 64.
—— cytisoides, i. 64; iv. 9.
—— *ixina*, i. 64.
—— lanceolata, i. 64.
—— palmeri, iv. 72.
—— parvifolia, i. 64.
—— *parvifolia*, β. *ramosissima*, iv. 9.
—— pauciflora, i. 64.
—— ramosissima, i. 64; iv. 9.
—— revoluta, i. 64.
—— secundiflora, i. 64.
Krombholzia latifolia, iii. 577.
—— *mexicana*, iii. 577.
KRYNITZKIA, iv. 72.
Krynitzkia floribunda, iv. 72.
—— *heliotropoides*, iv. 72.
KUHNIA, ii. 108.
Kuhnia eupatorioides, ii. 108.
—— rosmarinifolia, iv. 51.
—— *rosmarinifolia*, ii. 108.
KYLLINGA, iii. 453.
Kyllinga aphylla, iii. 454.
—— brevifolia, iii. 453.
—— cæspitosa, iii. 453.
—— *kunthiana*, iii. 453.
—— liebmanniana, iii. 454.
—— *microcephala*, iii. 454.
—— odorata, iii. 454.
—— *odorata*, iv. 231.
—— *pumila*, α. *humilis*, iii. 453.
—— *sesquiflora*, iii. 454.
—— vaginata, iii. 454.
—— *vaginata*, iv. 231.

LABIATÆ, ii. 541; iv. 80, 107.
Labiatæ, iv. 166, 189, 202, 215, 217, 225, 229, 231, 233, 258.
LACÆNA, iii. 252.

Lacæna bicolor, iii. 253.
—— *bicolor*, var. *glabrata*, iii. 253.
—— spectabilis, iii. 253.
Lacepedea insignis, i. 215.
—— *pinnata*, i. 216; iv. 147.
Lachnagrostis, iii. 553.
Lachnanthes tinctoria, iii. 324.
LACHNOSTOMA, ii. 335.
Lachnostoma, ii. 330; iv. 254.
Lachnostoma lasiostemma, ii. 335.
—— *prostratum*, ii. 333.
—— *tigrinum*, ii. 334, 335.
Lacis fœniculacea, iii. 39.
—— *schiedeana*, iii. 39.
LACISTEMA, iii. 181.
Lacistema, iv. 264.
Lacistema myricoides, iii. 181.
—— *myricoides*, iv. 264.
LACISTEMACEÆ, iii. 181.
Lacistemaceæ, iv. 194, 205, 217, 264.
LACTUCA, ii. 262.
Lactuca intybacea, ii. 262.
Lænnecia filaginoides, ii. 126.
—— *gnaphaloides*, ii. 126.
—— *parvifolia*, ii. 127.
LÆLIA, iii. 245.
Lælia, iv. 303.
Lælia acuminata, iii. 246.
—— albida, iii. 246.
—— *albida*, iv. 303, 304.
—— anceps, iii. 246.
—— *anceps*, var. *barkeriana*, iii. 246.
—— autumnalis, iii. 246.
—— digbyana, iii. 246.
—— *discolor*, iii. 246.
—— *flava*, iii. 246.
—— furfuracea, iii. 246.
—— *furfuracea*, iv. 295, 303, 304.
—— glauca, iii. 246.
—— *grandiflora*, iv. 303.
—— majalis, iii. 247.
—— *majalis*, iv. 295.
—— peduncularis, iii. 247.
—— *peduncularis*, iv. 303.
—— rubescens, iii. 247.
—— superbiens, iii. 247.
—— violacea, iii. 247.
—— wendlandi, iii. 247.
Læliopsis chinensis, iii. 235.
LÆTIA, i. 56.
Lætia thamnia, i. 57.
LAFOENSIA, i. 448.
Lafoensia punicifolia, i. 448.
Lagasca, ii. 139.
LAGASCEA, ii. 139.
Lagascea, iv. 120.
Lagascea angustifolia, ii. 139.
—— biflora, ii. 139.
—— *campestris*, ii. 140.
—— decipiens, ii. 140.
—— *helianthifolia*, ii. 141.
—— heteropappus, ii. 140.
—— *kunthiana*, ii. 140.
—— *latifolia*, ii. 141.
—— moçiniana, ii. 140.
—— mollis, ii. 140.
—— rubra, ii. 141.
—— suaveolens, ii. 141.
Lagenaria vulgaris, i. 482.
Lagenocarpus, iii. 468.
Lagochilium hydromestus, ii. 512.
—— *schiedeanum*, ii. 513.
LAGUNCULARIA, i. 403.
Laguncularia, iv. 230.
Laguncularia racemosa, i. 403.
—— *racemosa*, iv. 230.
Lamarkea, ii. 429.
LAMOUROUXIA, ii. 464.
Lamourouxia, iv. 149, 257.
—— *betonicæfolia*, ii. 465.
—— cordata, ii. 466.
—— dependens, ii. 464.
—— gutierrezii, ii. 464.
—— *jalapensis*, iv. 148.
—— *laciniata*, ii. 465.
—— lanceolata, ii. 464.
—— *linearis*, ii. 466.
—— longiflora, ii. 465.
—— macrantha, ii. 465.
—— *macrantha*, iv. 292.
—— microphylla, ii. 465.
—— multifida, ii. 465.
—— *multifida*, iv. 148, 292.
—— ovata, ii. 465.
—— *ovata*, iv. 292.
—— parviflora, ii. 465.
—— *parviflora*, ii. 465.
—— rhinanthifolia, ii. 465.
—— *scabra*, ii. 464.
—— spathacea, ii. 466.
—— tenuifolia, ii. 466.
—— viejensis, ii. 466.
—— viscosa, ii. 466.
—— xalapensis, ii. 466.
Lampra volcanica, iii. 397.
Lamproconus jacksoni, iii. 316.
LANGSDORFFIA, iii. 88.
Langsdorffia hypogæa, iii. 88.
Lansbergia caracasana, iii. 326.
—— *martinicensis*, iii. 326.
LANTANA, ii. 527.
Lantana aculeata, ii. 527.
—— *bracteosa*, ii. 529.
Lantana camara, ii. 527; iv. 106.
—— canescens, ii. 527.
—— *geroldiana*, ii. 527.
—— hirsuta, ii. 527.
—— *hirta*, ii. 527.
—— hispida, ii. 527.
—— horrida, ii. 528.
—— involucrata, ii. 528; iv. 106.
—— *lamiifolia*, ii. 527.
—— *lippioides*, ii. 529.
—— macropoda, ii. 528.
—— mollis, ii. 528.
—— multicolor, ii. 528.
—— odorata, iv. 113.
—— *odorata*, ii. 528.
—— ——, var. *berlandieri*, ii. 528.
—— *origanoides*, ii. 529.
—— *polyacantha*, ii. 527.
—— *scabrida*, ii. 527.
—— *teucriifolia*, ii. 527.
—— tiliæfolia, ii. 528.
—— trifolia, ii. 528.
—— vetulina, ii. 528.
LAPHAMIA, ii. 210.
Laphamia, iv. 140.
Laphamia aglossa, ii. 210.
—— *bisetosa*, iv. 142.
—— coronopifolia, ii. 210.
—— *dissecta*, iv. 142.
—— lemmoni, ii. 210.
—— parryi, ii. 210.
LAPORTEA, iii. 154.
Laportea canadensis, iii. 154.
—— *liebmannii*, iii. 155.
—— mexicana, iii. 155.
—— nicaraguensis, iii. 155.
—— *platycarpa*, iii. 155.
—— pustulata, iii. 154.
Lappago, iii. 518.
—— *aliena*, iii. 518.
—— *racemosa*, iii. 518.
Larnax, ii. 422.
—— *xalapensis*, ii. 422.
LARREA, i. 158.
Larrea, iv. 142.
Larrea glutinosa, iv. 17.
—— mexicana, i. 159.
—— *mexicana*, iv. 140, 141.
LASEGUEA, ii. 317.
Laseguea foliosa, ii. 316.
—— villosa, ii. 317.
Lasiandra bipenicillatum, i. 418.
Lasianthæa helianthoides, ii. 172.
LASIOCARPUS, i. 150.
Lasiocarpus salicifolius, i. 150.
Lasiogyne potsii, ii. 116.

Lasionema, ii. 7.
—— *glabrescens*, ii. 7.
Lasiostega humilis, iii. 566.
Lastrea abrupta, iii. 649.
—— ampla, iii. 644.
—— *athyrioides*, iii. 650.
—— *bourgæi*, iii. 644.
—— caripensis, iii. 645.
—— *ciliata*, iii. 644.
—— concinna, iii. 645.
—— contermina, iii. 645.
—— denticulata, iii. 645.
—— *dilatata*, iii. 646.
—— effusa, iii. 646.
—— *equestris*, iii. 644.
—— falciculata, iii. 646.
—— filix-mas, iii. 646.
—— *geropogon*, iii. 649.
—— grisebachii, iii. 647.
—— guatemalensis, iii. 647.
—— *indecora*, iii. 649.
—— karwinskyana, iii. 647.
—— lanceolata, iii. 647.
—— *leptorrhachis*, iii. 649.
—— lindeni, iii. 648.
—— *lugubris*, iii. 649.
—— *macroura*, iii. 649, 650.
—— *mexicana*, iii. 647, 649.
—— *palatangana*, iii. 644.
—— *parallelogramma*, iii. 647.
—— *patens*, iii. 649.
—— patula, iii. 649.
—— *paupertina*, iii. 649.
—— puberula, iii. 649.
—— rigida, iii. 649.
—— *rudis*, iii. 649.
—— salvinii, iii. 650.
—— sancta, iii. 650.
—— sloanei, iii. 650.
—— *spectabilis*, iii. 652.
—— sphærocarpa, iii. 650.
—— sprengelii, iii. 650.
—— tetragona, iii. 650.
—— trianæ, iii. 651.
—— tricholepis, iii. 651.
—— tristis, iii. 651.
—— villosa, iii. 651.
LATHYRUS, i. 293.
Lathyrus mexicanus, i. 293.
—— palustris, i. 293.
—— parvifolius, iv. 30.
—— polymorphus, i. 293.
—— *tingitanus*, i. 293.
—— venosus, i. 293.
—— *venosus*, iv. 30.
LAURENTIA, ii. 265.
Laurentia ramosissima, ii. 265.
Laureria, ii. 429.
Laureria mexicana, ii. 430.
LAURINEÆ, iii. 70; iv. 108.
Laurineæ, iv. 156, 192, 203, 217, 231, 260.
Laurus longipes, iii. 72.
LAWSONIA, i. 448.
Lawsonia alba, i. 448; iv. 100.
LAYIA, ii. 208.
Layia neomexicana, ii. 208.
Lebetanthus, iv. 207, 235.
Lebetina cancellata, ii. 218.
LECHEA, i. 46.
Lechea, iv. 235.
Lechea major, iv. 8.
—— *mexicana*, i. 47.
—— skinneri, i. 46.
Lecidea, iv. 148, 149.
—— *atroalba*, iv. 150.
—— *atrovirens*, iv. 150.
—— *wahlenbergii*, iv. 150.
LECOSTEMON, i. 367.
Lecostemon, i. 142.
Lecostemon terniflorum, i. 367.
LECYTHIDEÆ, i. 413.
LECYTHIS, i. 414.
Lecythis coriacea, i. 414.
LEERSIA, iii. 514.
Leersia gouini, iii. 514.
—— hexandra, iii. 514.
—— *hexandra*, iv. 296.
—— *lenticularis*, iii. 514.
—— ligularis, iii. 514.
—— *mexicana*, iii. 514.
—— monandra, iii. 514.
—— *oryzoides*, iii. 514.
—— ovata, iii. 514.
—— *virginica*, iii. 514.
LEGNOTIDEÆ, i. 402.
Legnotis elliptica, i. 402.
LEGUMINOSÆ, i. 225; iv. 25, 99.
Leguminosæ, iv. 178, 202, 215, 217, 225, 229, 230, 233, 238.
LEIANTHUS, ii. 344.
Leianthus, iv. 285.
Leianthus axillaris, ii. 344; iv. 70.
—— brevidentatus, ii. 344.
—— *cuspidatus*, ii. 345.
—— *lanceolatus*, ii. 350.
—— nigrescens, ii. 345.
—— saponarioides, ii. 345.
—— seemannii, ii. 345.
—— skinneri, ii. 345.
Leiboldia ovata, ii. 72.
Leighia leptocephala, ii. 178.
—— *linearis*, ii. 178.
—— *speciosa*, ii. 176.
—— *sphærocephala*, ii. 179.
—— *urticiformis*, ii. 179.
LEIOCHILUS, iii. 289.
Leiochilus carinatus, iii. 289.
—— oncidioides, iii. 289.
Leiphaimos parasitica, ii. 344.
Leitnerieæ, iii. 162; iv. 193.
LEMNA, iii. 435.
Lemna gibba, iii. 436.
—— minima, iii. 437.
—— minor, iii. 436.
—— *minor*, iii. 437.
—— *minuta*, iii. 436.
—— paucicostata, iii. 436.
—— polyrhiza, iii. 436.
—— trisulca, iii. 436.
—— valdiviana, iii. 436.
—— *valdiviana*, iii. 437.
—— ——, var. *minima*, iii. 436.
LEMNACEÆ, iii. 435.
Lemnaceæ, iv. 198, 204.
LENNEA, i. 260.
Lennea melanocarpa, iv. 27.
—— robinioides, i. 260; iv. 27.
—— viridiflora, i. 260.
LENNOA, ii. 286.
Lennoa cærulea, ii. 286.
—— madreporoides, ii. 286.
LENNOACEÆ, ii. 286.
Lennoaceæ, iv. 185, 205, 215, 217, 254.
LENTIBULARIACEÆ, ii. 469; iv. 79.
Lentibularieæ, iv. 188, 204.
Leochilus, iii. 289.
—— *leiboldi*, iii. 272.
Leonia salvifolia, ii. 559.
LEPANTHES, iii. 204.
Lepanthes avis, iii. 205.
—— blepharistes, iii. 205.
—— elata, iii. 205.
—— erinacea, iii. 205.
—— horrida, iii. 205.
—— lindleyana, iii. 205.
—— *ophioglossoides*, iv. 270.
—— pristidis, iii. 205.
—— schiedei, iii. 205.
—— tipulifera, iii. 205.
—— tridentata, iii. 205.
—— turialvæ, iii. 205.
—— wendlandi, iii. 205.
LEPECHINIA, ii. 551.
Lepechinia procumbens, ii. 551; iv. 81.
—— spicata, ii. 551.
Lepicystis incana, iii. 660.
LEPIDAGATHIS, ii. 511.
Lepidagathis alopecuroidea, ii. 512.
LEPIDINEÆ, i. 38.
LEPIDIUM, i. 38.
Lepidium alyssoides, i. 38.
—— *alyssoides*, iv. 141.

Lepidium humboldtii, i. 38.
—— intermedium, i. 38.
—— lasiocarpum, var. tenuipes, iv. 6.
—— latifolium, i. 39.
—— menziesii, i. 39.
—— montanum, i. 39.
—— virginicum, i. 39.
Lepidocereus pringlei, iv. 45.
Lepidococca sieberi, iii. 120.
Lepidozamia peroffskyana, iii. 195.
Leptanthus gramineus, iii. 384.
—— *ovalis*, iii. 385.
—— *reniformis*, iii. 385.
Leptocallis quinata, ii. 384.
—— *ternata*, ii. 394.
Leptocalyx, i. 441.
Leptocalyx debilis, i. 439.
—— intermedia, i. 441.
Leptocarpus, iv. 207, 235.
Leptocaulis echinatus, i. 565.
LEPTOCHLOA, iii. 565.
Leptochloa anoplia, iii. 558.
—— domingensis, iv. 114.
—— *dubia*, iii. 569.
—— *fascicularis*, iii. 569.
—— *filiformis*, iii. 565.
—— *humilis*, iii. 558.
—— liebmannii, iii. 565.
—— mucronata, iii. 565.
—— paniculata, iii. 566.
—— *pellucidula*, iii. 565.
—— *polystachya*, iii. 569.
—— stricta, iii. 566.
—— virgata, iii. 566.
—— *virgata*, iv. 114.
—— virletii, iii. 566.
Leptocoryphium lanatum, iii. 483.
—— *molle*, iii. 483.
Leptoglossis, ii. 437.
—— *coulteri*, ii. 437.
—— *texana*, ii. 437, 438.
—— viscosa, ii. 437.
Leptogramme asplenoides, iii. 676.
—— diplazioides, iii. 676.
—— pilosa, iii. 678.
—— *pilosa*, β. *major*, iii. 678.
Leptophragma prostrata, ii. 436.
Leptopus hartwegi, iii. 90.
—— *ocymoides*, iii. 97.
—— *segoviensis*, iii. 100.
LEPTORHŒO, iii. 396.
Leptorhœo filiformis, iii. 396.
Leptostachya comata, ii. 518.
Leptostelma maximum, ii. 124.
LEPUROPETALON, i. 383.
Lepuropetalon, iv. 240.
Lepuropetalon spathulatum, i. 383.
Leria nutans, ii. 255.
—— *spathulata*, ii. 255.
Lesourdia karwinskyana, iii. 570.
—— *multiflora*, iii. 570.
LESPEDEZA, i. 291.
Lespedeza repens, iv. 30.
—— stuvei, i. 291.
LESSINGIA, ii. 117.
Lessingia ramulosa, ii. 117.
LEUCÆNA, i. 351.
Leucæna diversifolia, i. 351.
—— esculenta, i. 351.
—— glauca, i. 351; iv. 33.
—— macrophylla, i. 351.
—— pulverulenta, i. 351.
Leucanthea rœmeriana, ii. 436.
LEUCHTENBERGIA, i. 528.
Leuchtenbergia principis, i. 528.
LEUCOCARPUS, ii. 448.
Leucocarpus alatus, ii. 448.
—— *fruticosus*, ii. 448.
—— *perfoliatus*, ii. 448.
Leucococcus occidentalis, iii. 159.
Leucoglossum erosum, iii. 277.
LEUCOPHYLLUM, ii. 439.
Leucophyllum ambiguum, ii. 439.
—— *campanulatum*, ii. 439.
—— minus, ii. 439.
—— texanum, ii. 439.
Leucopsidium humile, ii. 117.
Lexarza, i. 127.
—— *funebris*, i. 127.
LIABUM, ii. 231.
Liabum andrieuxii, ii. 231.
—— andromachioides, ii. 231.
—— asclepiadeum, ii. 231.
—— deppeanum, ii. 232.
—— discolor, ii. 232.
—— glabrum, ii. 232.
—— *melastomoides*, ii. 232.
—— sericolepis, ii. 232.
LIATRIS, ii. 108.
Liatris punctata, ii. 108; iv. 51.
LICANIA, i. 365.
Licania arborea, i. 365.
—— hypoleuca, i. 365.
Lichterveldia lindleyi, iii. 274.
Lieberkuhnia ehrenbergii, ii. 255.
—— *spathulata*, ii. 255.
Lightfootia, ii. 16.
LIGUSTICUM, i. 569.
Ligusticum dubium, i. 569.
Ligusticum dubium, iv. 286.
—— *toluccense*, i. 564.
LILIACEÆ, iii. 362; iv. 91, 109.
Liliaceæ, iv. 197, 202, 215, 217, 226, 229, 274.
Lilium, iii. 379.
LIMNANTHEMUM, ii. 353.
Limnanthemum humboldtianum, ii. 353.
LIMNOBIUM, iii. 196.
Limnobium stoloniferum, iii. 196.
LIMNOCHARIS, iii. 440.
Limnocharis emarginata, iii. 440.
—— flava, iii. 440.
—— *laforesti*, iii. 440.
—— *plumieri*, iii. 440.
Limnochloa calyptrata, iii. 455.
—— *geniculata*, iii. 456.
—— *mutata*, iii. 456.
—— *truncata*, iii. 455.
Limnonesis commutata, iii. 417
—— *friedrichsthaliana*, iii. 417.
LIMNOSIPANIA, ii. 28.
Limnosipania palustris, ii. 28.
Limodorum altum, iii. 215.
—— *floridum*, iii. 214.
—— *pendulum*, iii. 268.
—— *purpureum*, iii. 216.
—— *tuberosum*, iii. 215, 216.
—— *verecundum*, iii. 215.
LIMOSELLA, ii. 453.
Limosella aquatica, ii. 454.
LINACEÆ, i. 142; iv. 16.
Linaceæ, iv. 175, 204, 224.
Linaria canadensis, ii. 440.
Lindackeria laurina, i. 56.
LINDENIA, ii. 26.
Lindenia acutiflora, ii. 26.
—— *gypsophiloides*, iii. 5.
—— rivalis, ii. 26.
LINDHEIMERA, ii. 147.
Lindheimera mexicana, ii. 147.
LINDLEYA, i. 370.
Lindleya, iv. 240.
Lindleya mespiloides, i. 370.
Lindsæa, iii. 606.
LINDSAYA, iii. 606.
Lindsaya curvans, iii. 606.
—— *elegans*, iii. 606.
—— *galeottii*, iii. 606.
—— guianensis, iv. 115.
—— *guyanensis*, iii. 606.
—— imbricata, iii. 606.
—— *microphylla*, iii. 606.
—— *multifrondulosa*, iii. 606.
—— portoricensis, iii. 606.
—— *quadrangularis*, iii. 606.
—— stricta, iii. 606.
—— trapeziformis, iii. 606; iv. 115.
LINDSAYEÆ, iii. 606.
LINEÆ, i. 143.
Lineæ, i. 142.
Linostachys padifolia, iii. 128.
Linosyris carnosa, ii. 120.

Linosyris heterophylla, ii. 115.
—— *hirtella*, ii. 115.
—— *mexicana*, ii. 115.
—— *pulchella*, ii. 115.
—— *ramulosa*, ii. 131.
—— *texana*, ii. 132.
—— *wrightii*, ii. 115.
LINUM, i. 143.
Linum aristatum, i. 143.
—— berlandieri, i. 143.
—— coulterianum, i. 144.
—— cruciatum, i. 143; iv. 16.
—— cymosulum, i. 144.
—— *decurrens*, i. 144.
—— greggii, i. 143; iv. 16.
—— guatemalense, i. 143.
—— hypericifolium, i. 143.
—— lecheoides, iv. 16.
—— mexicanum, i. 143.
—— orizabæ, i. 143.
—— perenne, i. 144.
—— rigidum, iv. 16.
—— rupestre, i. 144.
—— scabrellum, i. 144; iv. 16.
—— schiedeanum, i. 144; iv. 16.
—— *schiedeanum*, i. 143.
—— tenellum, i. 144.
—— usitatissimum, i. 144.
—— virginianum, i. 144.
LIPARIS, iii. 212.
Liparis, iii. 211.
Liparis alata, iii. 212.
—— arnoglossophylla, iii. 212.
—— *elata*, iii. 212.
—— elliptica, iii. 212.
—— *elliptica*, iv. 270.
—— bituberculata, iii. 212.
—— *wendlandi*, iii. 212.
LIPOCARPHA, iii. 464.
Lipocarpha gracilis, iii. 464.
—— *mexicana*, iii. 464.
—— sphacelata, iii. 464.
—— *triceps*, iii. 464.
Lipochæta fasciculata, ii. 172.
—— *lantanifolia*, ii. 173.
—— *macrocephala*, ii. 173.
—— *monocephala*, ii. 173.
—— *serrata*, ii. 174.
—— *strigosa*, ii. 174.
—— *tagetiflora*, ii. 175.
—— *texana*, ii. 170.
—— *umbellata*, ii. 172, 173.
Lipotriche gymnolomoides, ii. 182.
LIPPIA, ii. 528.
Lippia, ii. 527; iv. 147.
Lippia americana, ii. 529.
—— *asperifolia*, ii. 529.
—— berlandieri, ii. 529.
Lippia betulæfolia, ii. 529.
—— *bicolor*, ii. 529.
—— callicarpæfolia, ii. 529.
—— *callicarpæfolia*, iv. 292.
—— *calocephala*, ii. 529.
—— cardiostegia, ii. 529.
—— dulcis, ii. 529.
—— *elegans*, ii. 530.
—— geminata, ii. 529.
—— graveolens, ii. 529.
—— hirsuta, ii. 530.
—— *hyptoides*, ii. 529.
—— lanata, ii. 530.
—— lanceolata, ii. 530.
—— *lanceolata*, ii. 531.
—— lycioides, ii. 530.
—— myriocephala, ii. 530.
—— nodiflora, ii. 530; iv. 106, 113.
—— origanoides, ii. 530.
—— *pallescens*, ii. 527.
—— *panamensis*, ii. 529.
—— purpurea, ii. 531.
—— *queretarensis*, ii. 530.
—— reptans, ii. 531.
—— *sphacelifolia*, ii. 530.
—— stœchadifolia, iv. 107.
—— *strigulosa*, ii. 531.
—— substrigosa, ii. 531.
—— umbellata, ii. 531.
—— wrightii, ii. 531.
LIQUIDAMBAR, i. 400.
Liquidambar, iv. 241, 302, 309, 312, 314.
Liquidambar macrophylla, i. 400.
—— styraciflua, i. 400.
—— *styraciflua*, iv. 146, 309.
LISIANTHUS, ii. 349.
Lisianthus, iv. 255.
—— *acutangulus*, ii. 349.
—— crassicaulis, ii. 349.
—— *cuspidatus*, ii. 345.
—— *glaucifolius*, ii. 348, 349.
—— *nigrescens*, ii. 345.
—— œrstedii, ii. 349.
—— *russellianus*, ii. 349.
—— *saponarioides*, ii. 345.
—— tetragonus, ii. 349.
Lithachne axillaris, iii. 510.
LITHOSPERMUM, ii. 380.
Lithospermum, iv. 150.
Lithospermum angustifolium, ii. 381.
—— canescens, ii. 381.
—— discolor, ii. 381.
—— distichum, ii. 381.
—— *distichum*, iv. 291.
—— linifolium, ii. 381.
—— *longiflorum*, ii. 381.
—— *mandanense*, ii. 381.
Lithospermum matamorense, ii. 381; iv. 73.
—— palmeri, iv. 73.
—— spathulatum, ii. 381.
—— *spathulatum*, iv. 291.
—— strictum, ii. 381.
—— *strictum*, iv. 291.
Litobrochia aculeata, iii. 621.
—— *arborescens*, iii. 623.
—— *galeottii*, iii. 622.
—— *grandis*, iii. 623.
—— hænkeana, iii. 623.
—— *hemipteris*, iii. 621.
—— elata, iii. 623.
—— incisa, iii. 623.
—— kunzeana, iii. 623.
—— *mexicana*, iii. 624, 625.
—— *orizabæ*, iii. 621.
—— podophylla, iii. 624.
—— *propinqua*, iii. 621.
—— pulchra, iii. 624.
—— setifera, iii. 621.
LITSEA, iii. 76.
Litsea, iv. 149.
—— *cervantesii*, iii. 76.
—— corymbifera, iii. 76.
—— glaucescens, iii. 76.
—— *glaucescens*, iv. 260, 293.
—— major, iii. 76.
—— neesiana, iii. 76.
—— *neesiana*, iv. 293.
—— racemosa, iii. 76.
—— subcorymbosa, iii. 76.
—— subsolitaria, iii. 76.
—— villosa, iii. 76.
Littæa albicans, iii. 339.
—— angustissima, iii. 339.
—— attenuata, iii. 339.
—— botterii, iii. 340.
—— bouchei, iii. 340.
—— chloracantha, iii. 341.
—— dasylirioides, iii. 341.
—— densiflora, iii. 341.
—— ehrenbergiana, iii. 341.
—— elemeetiana, iii. 342.
—— geminiflora, iii. 343.
—— gœppertiana, iii. 343.
—— haseloffi, iii. 343.
—— horizontalis, iii. 344.
—— micracantha, iii. 346.
—— mitis, iii. 346.
—— parviflora, iii. 347.
—— rupicola, iii. 348.
—— schottii, iii. 349.
—— striata, iii. 350.
—— univittata, iii. 351.
—— xylonacantha, iii. 352.
—— yuccæfolia, iii. 352.
LLAVEA, i. 194; iii. 617.

Llavea, iv. 280.
Llavea cordifolia, iii. 617.
—— integrifolia, i. 194; iv. 21.
—— viscosa, i. 195.
LOASA, i. 473.
Loasa, iv. 244.
Loasa bicolor, iv. 38.
—— rhœadifolia, i. 473.
—— rudis, i. 473.
Loasaceæ, iv. 204, 215, 217, 225, 233, 244.
LOASEÆ, i. 471; iv. 38.
Loaseæ, iv. 180.
LOBELIA, ii. 266.
Lobelia, iv. 150, 213, 253.
—— *angulato-dentata*, ii. 267.
—— angustifolia, ii. 267.
—— *arabidoides*, ii. 269.
—— berlandieri, ii. 266.
—— *calcarata*, ii. 270.
—— *canescens*, ii. 265.
—— *cardinalis*, iv. 66.
—— *cavanillesii*, ii. 267.
—— circæoides, ii. 266.
—— cliffortiana, ii. 266.
—— *comosa*, ii. 265.
—— concolor, ii. 266.
—— *cordifolia*, ii. 270.
—— *discolor*, ii. 269.
—— divaricata, ii. 266.
—— *divaricata*, ii. 269.
—— ehrenbergii, ii. 266.
—— fenestralis, ii. 266.
—— flexuosa, ii. 267.
—— *formosa*, ii. 267.
—— fulgens, ii. 267.
—— *fulgens*, iv. 66.
—— ghiesbreghtii, ii. 267.
—— *grandidentata*, ii. 265.
—— gruina, ii. 267.
—— hartwegi, ii. 267.
—— *hartwegi*, iv. 289, 303.
—— *ignea*, ii. 267.
—— irazuensis, iv. 66.
—— *jalapensis*, iv. 147.
—— *lanceolata*, ii. 267.
—— laxiflora, ii. 267; iv. 66.
—— *laxiflora*, iv. 289.
—— micrantha, ii. 268.
—— minutiflora, ii. 268.
—— monticola, ii. 268.
—— mucronata, ii. 268.
—— nana, ii. 268.
—— *nana*, iv. 289.
—— neglecta, ii. 268.
—— ocimoides, ii. 268.
—— orizabæ, ii. 268.
—— *orizabæ*, iv. 289.
Lobelia ovalifolia, ii. 267.
—— parviflora, ii. 268.
—— pauciflora, ii. 269.
—— *pauciflora*, iv. 148.
—— *pectinata*, ii. 266.
—— *persicæfolia*, ii. 267.
—— *persicifolia*, iv. 303.
—— phyllostachya, ii. 269.
—— princeps, iv. 66.
—— pulchella, ii. 269.
—— punicea, iv. 66.
—— pusilla, ii. 269.
—— *ramosissima*, ii. 265.
—— rapunculoides, ii. 269.
—— *rigidula*, ii. 267.
—— sartorii, ii. 269.
—— *spicata*, ii. 266.
—— *splendens*, ii. 267.
—— *stricta*, ii. 266.
—— subnuda, ii. 269.
—— *subtilis*, ii. 268.
—— *surinamensis*, ii. 264.
—— *texensis*, ii. 267.
—— *velutina*, ii. 267.
—— *virescens*, ii. 263.
—— warscewiczii, ii. 269.
—— *xalapensis*, ii. 266.
Locheria heterophylla, ii. 474.
—— *hirsuta*, ii. 474.
—— *ignescens*, ii. 474.
—— *pedunculata*, ii. 475.
LOCKHARTIA, iii. 291.
Lockhartia amœna, iii. 291.
—— elegans, iii. 291.
—— *elegans*, iv. 270.
—— micrantha, iii. 291.
—— mirabilis, iii. 291.
—— œrstedii, iii. 292.
—— pallida, iii. 292.
—— verrucosa, iii. 292.
Loeflingia ramosissima, iii. 10.
LŒSELIA, ii. 356.
Lœselia amplectens, ii. 356.
—— *aristata*, ii. 356.
—— cærulea, ii. 356.
—— *cervantesii*, ii. 356.
—— ciliata, ii. 356.
—— *ciliata*, iv. 71.
—— coccinea, ii. 356.
—— *conglomerata*, ii. 356.
—— glandulosa, ii. 356.
—— gregii, iv. 71.
—— involucrata, ii. 357.
—— *involucrata*, iv. 71.
—— *nepetæfolia*, ii. 356.
—— rupestris, ii. 357.
LOGANIACEÆ, ii. 338; iv. 70.
Loganiaceæ, iv. 187, 203, 215, 217, 229.
Lolium perenne, iii. 584.
—— *temulentum*, iii. 584.
LOMARIA, iii. 625.
Lomaria acrodonta, iii. 626.
—— *alpina*, iii. 626.
—— *arguta*, iii. 627.
—— attenuata, iii. 625; iv. 116.
—— *binervata*, iii. 626.
—— *biserrata*, iii. 627.
—— blechnoides, iii. 625.
—— *brasiliensis*, iii. 626.
—— *campylotis*, iii. 628.
—— costaricensis, iii. 626.
—— *danæacea*, iii. 626.
—— *deflexa*, iii. 626.
—— ensiformis, iii. 626.
—— *falciformis*, iii. 626.
—— *fragilis*, iii. 626.
—— ghiesbreghtii, iii. 626.
—— *juglandifolia*, iii. 626.
—— *longifolia*, iii. 626.
—— *mexicana*, iii. 626.
—— onocleoides, iii. 626.
—— *ornifolia*, iii. 626.
—— *pectinata*, iii. 627.
—— procera, iii. 626; iv. 116.
—— *schiedeana*, iii. 626.
—— semicordata, iii. 627.
—— *sorbifolia*, iii. 689.
—— *spectabilis*, iii. 626.
—— *stolonifera*, iii. 626.
—— *striata*, iii. 626.
—— *varians*, iii. 626, 627.
Lomaridium semicordatum, iii. 627.
Lomariopsis erythrodes, iii. 689.
—— *recurvata*, iii. 689.
Lonchitis ghiesbreghtii, iii. 623.
—— *hirsuta*, iii. 623.
—— pubescens, iv. 115.
LONCHOCARPUS, i. 317.
Lonchocarpus atropurpureus, i. 318.
—— eriophyllus, i. 318.
—— fendleri, i. 318.
—— guatemalensis, i. 318.
—— hondurensis, i. 318; iv. 112.
—— jurgenseni, i. 318.
—— lanceolatus, i. 318.
—— latifolius, i. 318; iv. 112.
—— macrocarpus, i. 318.
—— *maculatus*, i. 260.
—— obovatus, i. 318.
—— parviflorus, i. 318.
—— phaseolifolius, i. 318.
—— rugosus, i. 318.
—— sericeus, i. 319.
—— *sericeus*, iv. 230.
—— unifoliatus, i. 319.
—— velutinus, i. 319.

Lonchocarpus violascens, i. 318; iv. 99.
LONICERA, ii. 5.
Lonicera, iv. 144, 248.
Lonicera albiflora, iv. 46.
—— dumosa, ii. 5.
—— gibbosa, ii. 5.
—— *gibbosa*, iv. 287.
—— involucrata, iv. 46.
—— moçiniana, ii. 5; iv. 46.
—— pilosa, ii. 5.
—— *tubulosa*, ii. 5.
LOPEZIA, i. 464.
Lopezia, i. 465; iv. 163.
Lopezia albiflora, i. 464.
—— cordata, i. 464.
—— coronata, i. 464.
—— *coronata*, i. 465, 466.
—— *frutescens*, i. 465.
—— *fruticosa*, i. 465.
—— galeottii, i. 464.
—— *galeottii*, iv. 285.
—— grandiflora, i. 464.
—— hæmatodes, i. 464.
—— hirsuta, i. 464.
—— *hirsuta*, iv. 147, 149, 285.
—— insignis, i. 464.
—— integrifolia, i. 465.
—— lineata, i. 465.
—— macrophylla, i. 465.
—— *macrophylla*, i. 464; iv. 285.
—— mexicana, i. 465.
—— *mexicana*, iv. 285.
—— miniata, i. 465.
—— oppositifolia, i. 465.
—— paniculata, i. 465.
—— pubescens, i. 465.
—— pumila, i. 465; iv. 37.
—— *racemosa*, i. 465.
—— trichota, i. 466.
LOPHANTHUS, ii. 567.
Lophanthus, iv. 229.
Lophanthus urticifolius, ii. 567.
Lophidium elegans, iii. 692.
Lophiocarpus guyanensis, iii. 438.
Lophosoria discolor, iii. 594.
—— *frigida*, iii. 594.
—— *pruinata*, iii. 594.
—— *warscewiczii*, iii. 594.
Lophospermum, ii. 442.
—— *atrosanguineum*, ii. 442.
—— *erubescens*, ii. 441.
—— *physalodes*, ii. 456.
—— *rodochiton*, ii. 442.
—— *scandens*, ii. 442.
Lopimia malacophylla, i. 117.
LORANTHACEÆ, iii. 80; iv. 84.
Loranthaceæ, iv. 192, 202, 217, 226.
LORANTHUS, iii. 80.
Loranthus, iv. 213.
Loranthus alveolatus, iii. 80.
—— americanus, iii. 80.
—— *angustifolius*, iii. 84.
—— auriculatus, iii. 80.
—— avicularius, iii. 80.
—— calyculatus, iii. 80.
—— cansjeræfolius, iii. 80.
—— chordocladus, iii. 80.
—— crassipes, iii. 81.
—— densiflorus, iii. 81.
—— deppeanus, iii. 81.
—— diversifolius, iii. 81.
—— glaberrimus, iii. 81.
—— grahami, iii. 81.
—— hartwegi, iii. 81.
—— immersus, iii. 81.
—— inconspicuus, iii. 81.
—— interruptus, iii. 81.
—— *jacquini*, iii. 80.
—— karwinskyanus, iii. 81.
—— kerberi, iv. 84.
—— liebmanni, iii. 81.
—— macrantherus, iii. 81.
—— marginatus, iii. 82.
—— mexicanus, iii. 82.
—— microphyllus, iii. 82.
—— occidentalis, iii. 82.
—— œrstedii, iii. 82.
—— polyrhizos, iii. 82.
—— quercicola, iii. 82.
—— ramiflorus, iii. 82.
—— rhynchanthus, iii. 82.
—— schiedeanus, iii. 82.
—— spirostylis, iii. 82.
—— surinamensis, iii. 83.
—— *surinamensis*, iv. 293.
—— tehuacanensis, iii. 83.
—— theobromæ, iii. 83.
—— vegetus, iii. 83.
—— venetus, iii. 83.
—— *viscifolius*, iii. 86.
Lorentea, ii. 154.
—— *atropurpurea*, ii. 155.
—— *auricularis*, ii. 224; iv. 62.
—— *canescens*, ii. 225; iv. 62.
—— *capillipes*, ii. 225.
—— *hænkeana*, ii. 225.
—— liebmannii, ii. 226.
—— *multiflosculosa*, ii. 224, 226.
—— *satureioides*, ii. 226; iv. 62.
LORENZANEA, i. 216.
Lorenzanea, i. 217.
—— *dentata*, i. 216.
—— *glabrata*, i. 217.
—— *ira*, i. 217.
Lorenzanea vernicosa, i. 217.
LOTEÆ, i. 233.
Loureira cuneifolia, iii. 108.
—— *glandulosa*, iii. 106.
Loxogramme lanceolata, iii. 680.
—— *lineata*, iii. 680.
Loxoscaphe thecifera, iii. 605.
Loxsoma, iii. 597.
LUCUMA, ii. 296.
Lucuma, iv. 234.
Lucuma campechiana, ii. 296.
—— capiri, ii. 296.
—— *capiri*, ii. 297.
—— ferruginea, ii. 296.
—— mammosa, ii. 296.
—— salicifolia, ii. 296.
—— sphærocarpa, ii. 296.
LUDWIGIA, i. 452.
Ludwigia palustris, i. 452; iv. 37.
LUFFA, i. 482.
Luffa acutangula, i. 482.
—— ægyptiaca, iv. 112.
—— *ægyptiaca*, i. 482.
—— cylindrica, iv. 39.
—— operculata, i. 483.
—— *quinquefida*, i. 483.
LUHEA, i. 140.
Luhea platypetala, i. 140; iv. 15.
—— *rufescens*, i. 140.
—— seemanni, i. 140.
Lundia chica, ii. 490.
LUPINUS, i. 229.
Lupinus, iv. 148, 150, 159, 163, 166, 239.
Lupinus aschenbornii, i. 229.
—— *aschenbornii*, iv. 283.
—— barkeri, i. 229.
—— barkeriæ, i. 229.
—— *bilineatus*, i. 230.
—— bimaculatus, i. 229.
—— *bimaculatus*, iv. 284.
—— campestris, i. 229.
—— *campestris*, iv. 284.
—— canus, i. 229.
—— clarkei, i. 229.
—— *clarkei*, iv. 157, 384.
—— *cytisoides*, i. 231.
—— ehrenbergii, i. 230; iv. 25.
—— elegans, i. 230.
—— *elegans*, iv. 284.
—— exaltatus, i. 230.
—— flabellaris, i. 230.
—— glabellus, i. 230.
—— *glabellus*, iv. 284.
—— hartwegii, i. 230.
—— leonensis, iv. 25.
—— leptocarpus, i. 230.
—— leptophyllus, i. 230.

Lupinus leptophyllus, iv. 149.
—— maderensis, i. 230.
—— marshallianus, i. 230.
—— mexicanus, i. 230.
—— *mexicanus*, iv. 284.
—— montanus, i. 230.
—— *montanus*, iv. 284.
—— mutabilis, i. 230.
—— pilosissimus, i. 231.
—— *pilosissimus*, iv. 284.
—— pulchellus, i. 231.
—— pusillus, i. 231.
—— ramosissimus, i. 231.
—— stipulatus, i. 231.
—— sylvaticus, i. 231.
—— uncinatus, i. 231.
—— vaginatus, i. 231.
—— *vaginatus*, iv. 149, 284.
LUXEMBERGIEÆ, i. 176.
LUZIOLA, iii. 513.
Luziola, iv. 280.
—— *alabamensis*, iii. 513.
—— *mexicana*, iii. 513.
—— peruviana, iii. 513.
LUZULA, iii. 400.
Luzula, iv. 149, 150.
—— *barbata*, iii. 400.
—— caricina, iii. 400.
—— *caricina*, iv. 296.
—— denticulata, iii. 400.
—— *denticulata*, iv. 296.
—— gigantea, iii. 400.
—— *gigantea*, iv. 296.
—— *interrupta*, iii. 400.
—— *lætevirens*, iii. 400.
—— *latifolia*, iii. 400.
—— racemosa, iii. 400.
—— *racemosa*, iv. 296.
—— *spicata*, iii. 400.
—— *vulcanica*, iii. 400.
LUZURIAGEÆ, iii. 367.
LYCASTE, iii. 253.
Lycaste aciantha, iii. 264.
—— aromatica, iii. 253.
—— *biseriata*, iii. 253.
—— *brevispatha*, iii. 253.
—— candida, iii. 253.
—— chrysoptera, iii. 254.
—— cochleata, iii. 254.
—— consobrina, iii. 254.
—— crinita, iii. 254.
—— cruenta, iii. 254.
—— deppei, iii. 254.
—— dowiana, iii. 254.
—— lasioglossa, iii. 254.
—— leucantha, iii. 254.
—— *leucantha*, iii. 253.
—— macrophylla, iii. 254.
Lycaste plana, iii. 254.
—— skinneri, iii. 254.
—— *sordida*, iii. 253.
—— tricolor, iii. 255.
—— xytriophora, iii. 255.
Lychnis pulchra, i. 66.
LYCIUM, ii. 425.
Lycium barbinodum, ii. 426.
—— *barbinodum*, iv. 113.
—— berlandieri, ii. 426.
—— brachyanthum, ii. 426.
—— *carolinianum*, ii. 426.
—— exsertum, iv. 75.
—— macrodon, iv. 75.
—— *macrophyllum*, ii. 424.
—— pallidum, ii. 426.
—— palmeri, ii. 426.
—— parviflorum, ii. 426.
—— quadrifidum, ii. 426.
—— schaffneri, ii. 426.
—— *senticosum*, ii. 426.
—— *stolidum*, ii. 426.
—— torreyi, ii. 426.
LYCOMORMIUM, iii. 252.
Lycomormium cerinum, iii. 252.
LYCOPERSICUM, ii. 403.
Lycopersicum esculentum, ii. 403.
LYCOPODIACEÆ, iii. 700; iv. 95.
Lycopodiaceæ, iv. 200, 204.
LYCOPODIUM, iii. 700.
Lycopodium, iii. 705; iv. 147, 148.
—— *acerosum*, iii. 703.
—— *axillare*, iii. 702.
—— cernuum, iii. 701.
—— *chilense*, iii. 705.
—— *circinale*, iii. 705.
—— clavatum, iii. 701.
—— *clavatum*, iv. 282, 298.
—— complanatum, iii. 701.
—— *contiguum*, iii. 701.
—— *cristatum*, iii. 701.
—— dichotomum, iii. 701.
—— *diffusum*, iii. 705.
—— *erythropus*, iii. 705.
—— *exaltatum*, iii. 706.
—— *flabellatum*, iii. 706, 707.
—— *fontinaloides*, *β. mexicanum*, iii. 703.
—— *fruticulosum*, iii. 706.
—— *geniculatum*, iii. 707.
—— *gracile*, iii. 706.
—— *gramineum*, iii. 702.
—— *insulare*, iii. 702.
—— *lepidophyllum*, iii. 707.
—— linifolium, iii. 702.
—— *mandioccanum*, iii. 701.
—— *microphyllum*, iii. 708.
—— *microstachyum*, iii. 706.
Lycopodium mollicomum, iii. 702.
—— *nitens*, iii. 702.
—— *passerinoides*, iii. 702.
—— *piliferum*, iii. 701.
—— *pithyoides*, iii. 701.
—— reflexum, iii. 702.
—— *sargassifolium*, iii. 702.
—— *serpens*, iii. 709.
—— serratum, iii. 702.
—— *stoloniferum*, iii. 706.
—— subulatum, iii. 702.
—— taxifolium, iii. 702.
—— *tenue*, iii. 703.
—— *thyoides*, iii. 701.
—— *trichiatum*, iii. 701.
—— *trichophyllum*, iii. 701.
—— verticillatum, iii. 703.
LYCOSERIS, ii. 254.
Lycoseris grandis, ii. 254.
—— latifolia, ii. 254.
—— *mexicana*, ii. 254.
—— squarrosa, ii. 254; iv. 113.
LYCURUS, iii. 544.
Lycurus phalaroides, iii. 544.
—— phleoides, iii. 544.
Lygistum spicatum, ii. 32.
LYGODIUM, iii. 694.
Lygodium commutatum, iii. 695.
—— digitatum, iii. 694.
—— *hastatum*, iii. 695.
—— heterodoxum, iii. 695.
—— *mexicanum*, iii. 695.
—— mexicanum, iii. 695.
—— *pubescens*, iii. 695.
—— *oligostachyum*, iii. 695.
—— *polymorphum*, iii. 695; iv. 300.
—— *scandens*, iii. 695.
—— *schiedeanum*, iii. 695.
—— venustum, iii. 695; iv. 114.
—— volubile, iii. 695; iv. 114.
Lyncea hispida, ii. 456.
Lyonia ferruginea, ii. 282.
—— *rigida*, ii. 282.
—— *squamulosa*, ii. 282.
LYSILOMA, i. 355.
Lysiloma acapulcensis, i. 356.
—— aurita, i. 356.
—— guachapele, i. 356.
—— microphylla, i. 356.
—— schiedeana, i. 356.
—— *schiedeana*, iv. 99.
—— tergemina, i. 356.
LYSIMACHIA, ii. 288.
Lysimachia glaucophylla, ii. 288.
—— *lubinioides*, ii. 288.
LYTHRACEÆ, i. 435; iv. 36, 100.
Lythraceæ, iv. 180, 217, 225, 230, 233, 243.

Lythrariæ, iv. 202, 215.
LYTHREÆ, i. 436.
LYTHRUM, i. 447.
Lythrum, i. 448.
Lythrum alatum, i. 447.
—— album, i. 447.
—— gracile, i. 447.
—— *gracile*, iv. 285.
—— hyssopifolium, i. 447.
—— kennedianum, i. 448.
—— maritimum, i. 448.

MABA, ii. 299.
Maba acapulcensis, ii. 300.
—— albens, ii. 300.
—— pavonia, ii. 300.
MABEA, iii. 133.
Mabea genuina, iii. 133.
—— montana, iii. 133.
—— *occidentalis*, iii. 133.
—— piriri, iii. 133.
MACFADYENA, ii. 492.
Macfadyena corymbosa, ii. 492.
—— *ovata*, ii. 492.
—— phellosperma, ii. 492.
—— uncinata, ii. 492.
Machæranthera canescens, ii. 120.
—— *parviflora*, ii. 122.
—— *setigera*, ii. 121.
—— *tanacetifolia*, ii. 123.
MACHÆRIUM, i. 314.
Machærium acaciæfolium, i. 315.
—— acuminatum, i. 314.
—— *affine*, i. 315.
—— angustifolium, i. 315.
—— latifolium, i. 314.
—— seemannii, i. 315.
MACHAONIA, ii. 42.
Machaonia fasciculata, iv. 47.
—— galeottiana, ii. 42.
—— hahniana, ii. 42.
—— lindeniana, ii. 43.
—— velutina, ii. 43.
—— *veracruzeana*, ii. 43.
MACLEANIA, ii. 271; iv. 254.
Macleania colorata, ii. 271.
—— cordata, ii. 271.
—— insignis, ii. 272.
—— *ovata*, ii. 271.
Macleya, i. 27.
Maclura, iii. 141.
—— *plumiera*, iii. 141.
—— *sieberi*, iii. 141.
—— *tinctoria*, iii. 141.
—— *velutina*, iii. 141.
MACRADENIA, iii. 292.
Macradenia brassavolæ, iii. 292.
Macreightia acapulcensis, ii. 300.
Macreightia albens, ii. 300.
—— *pavonia*, ii. 300.
MACROCNEMUM, ii. 7.
Macrocnemum candidissimum, ii. 12.
—— *coccineum*, ii. 15.
—— *corymbosum*, ii. 14.
—— exsertum, ii. 7.
—— glabrescens, ii. 7.
Macrolomia bracteata, iii. 469.
MACROMERIA, ii. 380.
Macromeria discolor, ii. 380.
—— *discolor*, iv. 291.
—— exserta, ii. 380.
—— *hispida*, ii. 380.
—— longiflora, ii. 380.
—— *longiflora*, iv. 291.
—— viridiflora, ii. 380.
Macromitrium, iv. 148.
Macropodium, i. 31.
MACROSCEPIS, ii. 320.
Macroscepis obovata, ii. 320.
—— rotata, ii. 320.
—— tristis, ii. 321.
MACROSIPHONIA, ii. 315.
Macrosiphonia berlandieri, ii. 315.
—— *berlandieri*, ii. 316.
—— brachysiphon, ii. 315.
—— hypoleuca, ii. 315.
—— lanuginosa, ii. 316.
Macrostema vitifolia, ii. 391.
Macrozamia littoralis, iii. 191.
—— *pectinata*, iii. 191.
—— *perowskiana*, iii. 195.
Madaroglossa neomexicana, ii. 208.
MAGNOLIA, i. 13.
Magnolia, iv. 146, 229, 309.
Magnolia dealbata, i. 13.
—— *dealbata*, i. 14.
—— *mexicana*, i. 13.
—— schiedeana, i. 13.
MAGNOLIACEÆ, i. 13.
Magnoliaceæ, iv. 171, 204, 229, 234.
MAGNOLIEÆ, i. 13.
Mahonia, i. 22, iv. 157.
—— *fascicularis*, i. 24.
—— *ilicina*, i. 23; iv. 3, 150.
—— *trifolia*, i. 23; iv. 3.
Majorana mexicana, ii. 551.
MALACHRA, i. 115.
Malachra alceæfolia, i. 115.
—— bracteata, i. 115.
—— capitata, i. 115.
—— *conglomerata*, i. 115.
—— digitata, i. 115.
—— *mexicana*, i. 115.
—— *ovata*, i. 117.
—— palmata, i. 115.
—— radiata, i. 115.
Malachra radiata, iv. 230.
—— *triloba*, i. 115.
—— urticæfolia, i. 115.
Malacocarpus corynodes, i. 530.
MALACOTHRIX, ii. 260.
Malacothrix fendleri, ii. 260.
—— tenuifolia, ii. 261.
MALANEA, ii. 43.
Malanea erecta, ii. 43.
Malaxis cochleariæfolia, iii. 210.
—— *elliptica*, iii. 211.
—— *galeottiana*, iii. 212; iv. 303, 305.
—— *gracilis*, iv. 305.
—— *ichthyorrhyncha*, iii. 210.
—— *lindeniana*, iii. 212.
—— *majanthemifolia*, iii. 210.
—— *monticola*, iii. 211.
—— *myurus*, iv. 303, 304.
—— *oblongifolia*, iii. 211.
—— *ophioglossoides*, iii. 210.
—— *parthoni*, iii. 210.
—— *thlaspiformis*, iii. 211.
—— *umbellulata*, iii. 211.
MALLOSTOMA, ii. 31.
Mallostoma acerosa, ii. 31.
—— *acerosa*, iv. 47.
MALORTIEA, iii. 402.
Malortiea, iv. 276.
Malortiea gracilis, iii. 402.
—— *intermedia*, iii. 402.
—— latisecta, iii. 402.
—— simplex, iii. 402.
MALOUETIA, ii. 310.
Malouetia, iv. 231.
Malouetia panamensis, ii. 310.
MALPIGHIA, i. 146.
Malpighia acuminata, i. 147.
—— *campechiensis*, i. 147.
—— emarginata, i. 146.
—— galeottiana, i. 146.
—— glabra, i. 147; iv. 111.
—— heterophylla, i. 147.
—— incana, i. 147.
—— mexicana, i. 147.
—— *nitida*, i. 147, 148.
—— parvifolia, i. 147.
—— punicifolia, i. 147.
—— *spicata*, i. 146.
—— undulata, i. 147; iv. 111.
—— *verbascifolia*, i. 146.
MALPIGHIACEÆ, i. 145; iv. 16, 97.
Malpighiaceæ, iv. 175, 202, 214, 216, 224, 230.
MALPIGHIEÆ, i. 145.
Malva angustifolia, i. 99.
—— *angustifolia*, i. 113.

Malva borealis, i. 98.
—— *caroliniana*, i. 114.
—— geranioides, i. 99.
—— *lactea*, i. 100.
—— macrostachya, i. 99.
—— *ovata*, i. 100.
—— *parviflora*, i. 98.
—— *peruviana*, i. 99.
—— *ribifolia*, i. 100.
—— *rosea*, i. 100, 114.
—— *spicata*, i. 100.
—— *subtriflora*, i. 100.
—— *tricuspidata*, i. 100.
—— *vitifolia*, i. 100.
MALVACEÆ, i. 98; iv. 13, 97.
Malvaceæ, i. 128; iv. 175, 202, 214, 216, 224, 230, 234, 237.
MALVASTRUM, i. 99.
Malvastrum angustifolium, i. 99.
—— *carpinifolium*, i. 100.
—— coccineum, i. 99.
—— geranioides, i. 99.
—— leptophyllum, i. 99.
—— macrostachyum, i. 99.
—— mexicanum, i. 99.
—— pedatifidum, i. 99.
—— peruvianum, i. 99.
—— ribifolium, i. 100.
—— roseum, i. 100.
—— spicatum, i. 100.
—— *spicatum*, iv. 234.
—— subtriflorum, i. 100.
—— thurberi, i. 100.
—— tricuspidatum, i. 100.
—— vitifolium, i. 100.
MALVAVISCUS, i. 118.
Malvaviscus acapulcensis, i. 118.
—— acerifolius, i. 118.
—— arboreus, i. 118.
—— *arboreus*, iv. 143.
—— brevipes, i. 118.
—— candidus, i. 118.
—— concinnus, i. 118.
—— drummondii, i. 119.
—— flavidus, i. 119.
—— grandiflorus, i. 119.
—— mollis, i. 119.
—— penduliflorus, i. 119.
—— pentacarpus, i. 119.
—— pilosus, i. 119.
—— *pilosus*, iv. 111.
—— pleurantherus, i. 119.
—— pleurogonus, i. 119.
—— populifolius, i. 119.
—— sepium, i. 119.
—— spathulatus, iv. 14.
MALVEÆ, i. 98.
MAMILLARIA, i. 502.
Mamillaria, iv. 140, 141, 144, 212, 245.
Mamillaria acanthophlegma, i. 502.
—— *acanthophlegma*, i. 504.
—— acanthostephes, i. 502.
—— acicularis, i. 502.
—— aciculata, i. 502, 507, 518.
—— acifer, iv. 43.
—— actinoplea, i. 502.
—— *adunca*, i. 507, 526.
—— æruginosa, i. 502.
—— affinis, i. 503.
—— albida, i. 507, 510.
—— *aloides*, i. 519.
—— alpina, i. 503.
—— altissima, i. 517.
—— amabilis, i. 503.
—— *ancistracantha*, i. 520.
—— *ancistroides*, i. 510.
—— andreæ, i. 521.
—— anguinea, i. 503.
—— *angularis*, i. 505.
—— *anisacantha*, i. 518.
—— applanata, i. 512.
—— areolosa, i. 503.
—— argentea, i. 503.
—— arietina, i. 514.
—— atrorubra, i. 503.
—— atrosanguinea, i. 503.
—— aulacantha, i. 503.
—— *aulacantha*, i. 516.
—— aulacothele, i. 503.
—— aureiceps, i. 503.
—— auricoma, i. 503.
—— aurorea, i. 503.
—— barbata, i. 503.
—— barlowii, i. 504.
—— benekei, i. 504.
—— *benekei*, i. 511.
—— bergenii, i. 504.
—— bergii, i. 504.
—— bicolor, i. 504.
—— *bicolor*, var. *nobilis*, i. 516.
—— bifurcata i. 504.
—— biglandulosa, i. 504.
—— bihamata, i. 504.
—— bockii, i. 504.
—— brevimamma, i. 504.
—— breviseta, i. 505.
—— cæspititia, i. 505.
—— *candida*, i. 523.
—— canescens, iv. 43.
—— *caput-medusæ*, i. 523.
—— carnea, i. 505.
—— castaneoides, i. 505.
—— *cataphracta*, i. 503.
—— centricirrha, i. 505.
—— centrispina, i. 505.
—— cephalophora, i. 505.
Mamillaria ceratocentra, i. 505.
—— *ceratophora*, i. 514.
—— chrysacantha, i. 505.
—— cirrhifera, i. 505.
—— clava, i. 505.
—— *clavata*, i. 520.
—— *columnaris*, i. 518.
—— compacta, i. 505.
—— compressa, i. 505.
—— coniflora, i. 508.
—— conoidea, i. 506; iv. 43.
—— *conoidea*, i. 511.
—— conopsea, i. 506.
—— *conopsea*, i. 515.
—— cornifera, i. 506.
—— *cornifera*, iv. 286.
—— corollaria, i. 506.
—— coronaria, i. 506.
—— crassispina, i. 506.
—— crebrispina, i. 506.
—— *crebrispina*, var. *nitida*, i. 505.
—— *criniformis*, i. 510.
—— crinita, i. 507.
—— crocidata, i. 507.
—— crucigera, i. 507.
—— curvispina, i. 507, 508.
—— cylindracea, i. 507.
—— *cylindracea*, i. 509.
—— *daimonoceras*, i. 522.
—— dealbata, i. 507.
—— decipiens, i. 507.
—— decora, iv. 43.
—— *deflexispina*, i. 510.
—— densa, i. 507.
—— *densa*, i. 508.
—— depressa, i. 507.
—— *diacantha*, i. 523.
—— diacentra, iv. 43.
—— diadema, i. 507.
—— *diaphanacantha*, i. 506.
—— dichotoma, i. 517.
—— disciformis, i. 507.
—— *disciformis*, i. 539.
—— discolor, i. 507.
—— *discolor*, i. 519.
—— divergens, i. 508.
—— dolichocentra, i. 508.
—— dyckiana, i. 508.
—— eborina, i. 508.
—— *eburnea*, i. 504.
—— *echinaria*, i. 508.
—— echinata, i. 508.
—— *echinata*, i. 507.
—— echinocactoides, i. 508.
—— echinus, i. 508.
—— ehrenbergii, i. 508.
—— elegans, i. 508.
—— elephantidens, i. 509.

Mamillaria elongata, i. 508, 509.
—— erecta, i. 509.
—— *erecta*, i. 505.
—— erectacantha, i. 509.
—— eriacantha, i. 509.
—— *erinacea*, i. 521.
—— euchlora, i. 509.
—— eximia, i. 509.
—— exudans, i. 509.
—— fellneri, i. 509.
—— *fennelii*, i. 527.
—— fischeri, i. 509.
—— flavescens, i. 509.
—— flaviceps, i. 517.
—— *flaviceps*, i. 506.
—— *floccigera*, i. 506.
—— formosa, i. 510.
—— *formosa*, i. 528.
—— försterii, i. 509.
—— foveolata, i. 510.
—— fulvispina, i. 510, 517.
—— funckii, i. 510.
—— fuscata, i. 510.
—— geminata, i. 510.
—— *geminispina*, i. 502, 504.
—— glabrata, i. 510.
—— gladiata, i. 510.
—— *gladiata*, iv. 286.
—— glanduligera, i. 510.
—— glauca, i. 510.
—— globosa, i. 520.
—— glochidiata, i. 510.
—— *glochidiata*, iv. 286.
—— goodrichii, i. 511.
—— *goodrichii*, i. 504.
—— gracilis, i. 511.
—— gracillima, i. 521.
—— grahami, i. 511.
—— grandicornis, i. 511.
—— grandiflora, i. 511.
—— granulata, i. 511.
—— greggii, i. 515.
—— grisea, i. 511.
—— *guilleminiana*, i. 507.
—— gummifera, i. 511.
—— haageana, i. 511.
—— hæmatactina, 511.
—— hamata, i. 511.
—— heinei, i. 511.
—— helicteres, i. 511.
—— hemisphærica, i. 512.
—— *heteracantha*, i. 513.
—— heteromorpha, i. 511.
—— hexacantha, i. 512, 518.
—— heyderi, i. 512.
—— humboldtii, i. 512.
—— hystrix, i. 512.
Mamillaria imbricata, i. 524.
—— implexicoma, i. 506.
—— *inconspicua*, i. 506.
—— incurva, i. 512.
—— intertexta, i. 512.
—— *intertexta*, i. 508.
—— *inuncta*, i. 521.
—— irregularis, i. 512.
—— isabellina, i. 512.
—— jucunda, i. 512.
—— karwinskiana, i. 512.
—— kleinii, i. 512.
—— klugii, i. 512.
—— krameri, i. 512.
—— kunthii, i. 513.
—— lactescens, i. 513.
—— lævior, i. 518.
—— *lævior*, i. 514.
—— lamprochæta, iv. 43.
—— lanifera, i. 513.
—— latimamma, i. 513, 518.
—— *latimamma*, i. 520.
—— lehmanni, i. 513.
—— *lehmanni*, i. 516.
—— *lehmannii*, i. 520.
—— *leucocarpa*, i. 514.
—— leucocentra, i. 513.
—— leucodasys, i. 513.
—— leucodictya, i. 513.
—— *lindheimeri*, i. 525.
—— linkeana, i. 513.
—— livida, i. 513.
—— longimamma, i. 513.
—— longiseta, i. 513.
—— *longispina*, i. 508.
—— loricata, i. 513.
—— ludwigii, i. 514.
—— *macracantha*, i. 527.
—— macromeris, i. 514.
—— macrothele, i. 514.
—— *macrothele*, i. 516.
—— magnimamma, i. 514.
—— *magnimamma*, iv. 286.
—— maschalacantha, i. 514.
—— megacantha, i. 514.
—— meiacantha, i. 514.
—— melaleuca, i. 514.
—— micans, i. 514.
—— microceras, i. 514.
—— micromeris, i. 514; iv. 43.
—— minima, i. 515.
—— mirabilis, i. 515.
—— monocentra, iv. 43.
—— mucronata, i. 515.
—— mühlenpfordtii, i. 515.
—— multiceps, i. 515.
—— multiseta, i. 515.
Mamillaria mutabilis, i. 515.
—— *mutabilis*, i. 514.
—— mutica, i. 506.
—— mystax, i. 515.
—— neglecta, i. 521.
—— neo-mexicana, i. 526.
—— neumanniana, i. 515.
—— nigra, i. 515.
—— nigricans, i. 515, 522.
—— nitens, i. 508.
—— *nitida*, i. 505; iv. 304.
—— nivea, i. 516.
—— *nivosa*, i. 527.
—— nobilis, i. 516.
—— nuda, i. 516.
—— obliqua, i. 516.
—— *obscura*, i. 508.
—— obvallata, i. 516.
—— octacantha, i. 516.
—— octospina, i. 522.
—— odieriana, i. 516.
—— ——, β. subcurvata, iv. 43.
—— olorina, i. 516.
—— ottonis, i. 516.
—— *pachythele*, i. 512.
—— pallescens, i. 516.
—— palmeri, iv. 43.
—— parkinsonii, i. 516.
—— *parvimamma*, i. 527.
—— pazzanii, i. 516.
—— pentacantha, i. 517.
—— *perote*, i. 511.
—— persicina, i. 517.
—— pfeifferiana, i. 517.
—— phæacantha, i. 517.
—— phæotricha, i. 517.
—— phellosperma, i. 517.
—— phymatothele, i. 517.
—— *phymatothele*, i. 506, 514.
—— picta, i. 517.
—— plaschnickii, i. 517.
—— plecostigma, i. 517.
—— pleiocephala, i. 518.
—— plinthimorpha, iv. 43.
—— polycentra, i. 518.
—— polycephala, i. 518.
—— *polychlora*, i. 506; iv. 304.
—— polyedra, i. 518.
—— polygona, i. 518.
—— *polygona*, i. 524.
—— polymorpha, i. 518.
—— polythele, i. 518.
—— pomacea, i. 518.
—— porphyracantha, iv. 44.
—— potosiana, iv. 44.
—— pottsii, i. 519.

Mamillaria prælii, i. 519.
—— *prælii*, i. 526.
—— pretiosa, i. 519.
—— prismatica, i. 519.
—— procera, i. 519.
—— prolifera, i. 521.
—— *prolifera*, i. 508.
—— pugionacantha, i. 519.
—— pulchella, i. 519.
—— *pulchella*, i. 508.
—— pulcherrima, i. 519.
—— pulchra, i. 519.
—— *pulchra*, i. 525.
—— purpurea, i. 519.
—— pusilla, i. 519.
—— pycnacantha, i. 520.
—— *pyramidalis*, i. 521.
—— pyrrhocephala, i. 520.
—— pyrrhochroacantha, i. 520.
—— quadrispina, i. 518, 520.
—— radians, i. 520; iv. 44.
—— *radula*, i. 517.
—— raphidacantha, i. 520, 522.
—— *recta*, i. 520.
—— recurva, i. 520.
—— recurvispina, i. 520.
—— regia, i. 520.
—— retusa, i. 520.
—— *retusa*, i. 525.
—— rhodantha, i. 521.
—— ——, ε. centrispina, iv. 44.
—— *rhodantha*, var. *rubens*, i. 510.
—— rhodeocentra, i. 521.
—— robustispina, i. 521.
—— rosea, i. 510, 521.
—— rubens, i. 521.
—— rubescens, i. 510.
—— rufidula, i. 521.
—— rufocrocea, i. 521.
—— rüschiana, i. 521.
—— rutila, i. 521.
—— salm-dyckiana, i. 522.
—— sanguinea, iv. 44.
—— saxatilis, i. 522.
—— scepontocentra, i. 522.
—— schaeferi, i. 522.
—— scheerii, i. 522.
—— scheidweileriana, i. 522.
—— schelhasii, i. 522.
—— schiedeana, i. 522.
—— schlechtendalii, i. 522.
—— scolymoides, i. 522.
—— seemannii, i. 522.
—— seidelii, i. 523.
—— seitziana, i. 523.
—— *seitziana*, i. 504.
—— sempervivi, i. 523.
Mamillaria senilis, i. 523.
—— *sericata*, i. 522.
—— setosa, i. 523.
—— severini, i. 523.
—— *similis*, i. 527.
—— simplex, i. 523.
—— sororia, i. 523.
—— speciosa, i. 523.
—— spectabilis, i. 523.
—— sphacelata, i. 523.
—— sphærica, i. 523.
—— sphærotricha, i. 523.
—— spinaurea, i. 524.
—— spinosissima, i. 524.
—— squarrosa, i. 524.
—— stella-aurata, i. 524.
—— stenocephala, i. 524.
—— *stenocephala*, i. 508.
—— *stipitata*, i. 520.
—— strobiliformis, i. 524.
—— stüberi, i. 524.
—— subangularis, i. 524.
—— subcrocea, i. 524.
—— *subcrocea*, i. 508.
—— subechinata, i. 524.
—— subpolyedra, i. 524.
—— subtetragona, i. 524.
—— subulifera, i. 524.
—— sulcata, i. 525.
—— sulcimamma, i. 503.
—— sulcoglandulifera, iv. 44.
—— sulcolonata, i. 525.
—— supertexta, i. 525.
—— *supertexta*, i. 508; iv. 286.
—— tentaculata, i. 525.
—— *tentaculata*, i. 519.
—— tenuis, i. 525.
—— tetracantha, i. 525.
—— tetracentra, i. 525.
—— *tetrancistra*, i. 517.
—— texana, i. 519.
—— texensis, i. 525.
—— *toaldoæ*, i. 516.
—— tomentosa, i. 525.
—— triacantha, i. 525.
—— tuberculosa, i. 525.
—— turbinata, i. 525.
—— *turbinata*, i. 539.
—— uberiformis, i. 525.
—— *uberiformis*, iv. 286.
—— umbrina, i. 526.
—— uncinata, i. 526.
—— *uncinata*, i. 504; iv. 286.
—— variabilis, i. 517.
—— variamamma, i. 526.
—— versicolor, i. 526.
—— vetula, i. 526.
Mamillaria vetula, iv. 286.
—— villifera, i. 526.
—— virens, i. 526.
—— viridis, i. 526.
—— *viridis*, i. 519.
—— vivipara, i. 526.
—— vulpina, i. 526.
—— webbiana, i. 526.
—— ——, β. longispina, iv. 44.
—— wegenerii, i. 526.
—— *wegenerii*, i. 505.
—— wendlandii, i. 521.
—— wildiana, i. 527.
—— winklerii, i. 527.
—— woburnensis, i. 527.
—— wrightii, i. 527.
—— xanthotricha, i. 527.
—— zephyranthoides, i. 527; iv. 286.
—— zepnickii, i. 527.
—— zuccariniana, i. 527.
MAMMEA, i. 89.
Mammea americana, i. 89; iv. 97.
—— emarginata, i. 89.
MANDEVILLA, ii. 316.
Mandevilla andrieuxii, ii. 316.
—— convolvulacea, ii. 316.
—— foliosa, ii. 316.
—— hispida, ii. 316.
—— karwinskii, ii. 316.
—— oaxacana, ii. 316.
—— palustris, ii. 317.
—— veraguensis, ii. 317.
Mandirola lanata, ii. 475.
—— *seemannii*, ii. 476.
MANETTIA, ii. 10.
Manettia barbata, ii. 10.
—— cuspidata, ii. 10.
—— hirtella, ii. 10.
—— panamensis, ii. 11.
—— reclinata, ii. 11.
—— zimapanica, ii. 11.
Manfreda brachystachys, iii. 340.
—— guttata, iii. 343.
—— maculata, iii. 345.
—— revoluta, iii. 348.
—— sessiliflora, iii. 350.
—— undulata, iii. 351.
—— variegata, iii. 351.
Mangifera indica, iv. 111.
—— *indica*, i. 220.
Manicaria, iv. 277.
MANIHOT, iii. 120.
Manihot æsculifolia, iii. 120.
—— angustiloba, iii. 120.
—— carthagenensis, iii. 120.
—— fœtida, iii. 121.
—— *janipha*, iii. 121.

Manihot microcarpa, iii. 121.
—— rhomboidea, iii. 121.
—— utilissima, iii. 121.
MANISURIS, iii. 521.
Manisuris granularis, iii. 521.
—— *granularis*, iv. 301.
Mapouria, ii. 50, 51.
—— *parviflora*, iv. 157.
MARANTA, iii. 310.
Maranta arundinacea, iii. 310.
—— gibba, iii. 310.
—— indica, iii. 310.
—— jacquini, iii. 310.
—— *lutea*, iii. 310.
MARANTEÆ, iii. 309.
MARATHRUM, iii. 39.
Marathrum flexuosum, iii. 39.
—— fœniculaceum, iii. 39.
—— oxycarpum, iii. 39.
—— ricciæforme, iii. 39.
—— schiedeanum, iii. 39.
—— tenue, iii. 39.
MARATTIA, iii. 696.
Marattia alata, iii. 696.
—— *alata*, iv. 298.
—— *lævis*, iii. 696.
—— laxa, iii. 696; iv. 116.
—— *microphylla*, iii. 696.
—— *weinmanniæfolia*, iii. 696.
MARATTIACEÆ, iii. 695.
MARCGRAVIA, i. 89.
Marcgravia affinis, i. 90.
—— *caudata*, i. 90.
—— nepenthoides, i. 90.
—— occidentalis, i. 91.
—— *paradoxa*, iii. 427.
—— parviflora, i. 91.
—— *pedunculosa*, i. 91.
—— *picta*, i. 91.
—— polyantha, i. 91.
Marcgraviaceæ, iv. 237.
MARCGRAVIEÆ, i. 89.
MARGARANTHUS, ii. 424.
Margaranthus lemmoni, iv. 75.
—— solanaceus, ii. 424.
—— *tenuis*, ii. 424.
Margaris, ii. 44.
—— *barbigera*, ii. 4.
Margarocarpus obliquus, iii. 159.
Marginaria dimorpha, iii. 654.
MARICA, iii. 325.
Marica, iv. 231.
Marica acorifolia, iii. 325.
—— *gracilis*, iii. 326.
—— *martinicensis*, iii. 326.
—— *paludosa*, iii. 328.
—— *tinctoria*, iii. 331.
Marica variegata, iii. 326.
MARILA, i. 98.
Marila macrophylla, i. 98.
MARINA, i. 235.
Marina gracilis, i. 235.
MARIPA, ii. 382.
Maripa densiflora, ii. 382.
—— nicaraguensis, ii. 382.
—— panamensis, ii. 382.
Mariscus, iii. 453.
—— *ambiguus*, iii. 453.
—— *asper*, iii. 453.
—— *atrosanguineus*, iii. 453.
—— *flavus*, iii. 447.
—— *longiradiatus*, iii. 448.
—— *mexicanus*, iii. 449.
—— *mutisii*, iii. 449.
—— *oaxacensis*, iii. 449.
—— *pallens*, iii. 453.
—— *patulus*, iii. 448.
—— *pycnostachyus*, iii. 450.
—— *karwinskianus*, iii. 449.
—— *rufus*, iii. 449.
—— *tribrachiatus*, iii. 453.
MARKEA, ii. 429.
Markea neurantha, ii. 429.
MARRUBIUM, ii. 570.
Marrubium hamatum, ii. 571.
—— vulgare, ii. 570.
MARSDENIA, ii. 336.
Marsdenia, iv. 254.
Marsdenia clausa, ii. 336.
—— coulteri, ii. 336.
—— crassipes, ii. 337.
—— maculata, ii. 337; iv. 104, 113.
—— mexicana, ii. 337.
—— *obovata*, ii. 336.
—— propinqua, ii. 337.
—— zimapanica, ii. 338.
MARSILIA, iii. 710.
Marsilia brevipes, iii. 711.
—— mexicana, iii. 710.
—— minuta, iii. 711.
—— *mucronata*, iii. 711.
—— *picta*, iii. 711.
—— polycarpa, iii. 711.
MARSYPIANTHES, ii. 542.
Marsypianthes hyptioides, ii. 542.
—— *secundiflora*, ii. 542.
Martia, iv. 30.
—— *mexicana*, i. 297; iv. 30.
MARTYNIA, ii. 499.
Martynia, iv. 119.
Martynia altheæfolia, ii. 499.
—— *angulosa*, ii. 499.
—— *annua*, ii. 500.
—— *arenaria*, ii. 499; iv. 142.
Martynia botterii, ii. 499.
—— diandra, ii. 499.
—— fragrans, ii. 499.
—— proboscidea, ii. 500.
—— triloba, ii. 500.
—— *violacea*, ii. 499; iv. 142.
Mascagavia spicigera, i. 155.
MASDEVALLIA, iii. 206.
Masdevallia astuta, iv. 89.
—— attenuata, iii. 207.
—— chontalensis, iii. 207.
—— cupularis, iii. 207.
—— *fenestrata*, iii. 207.
—— floribunda, iii. 207.
—— *floribunda*, var. *myriostigma*, iii. 207.
—— *galeottiana*, iii. 207.
—— gracilenta, iii. 207.
—— harryana, iii. 207.
—— lata, iii. 207.
—— *lindeni*, iii. 207.
—— ——, var. *harryana*, iii. 207.
—— lindeniana, iii. 207.
—— livingstoneana, iii. 208.
—— *myriostigma*, iii. 207.
—— reichenbachiana, iii. 208.
—— triaristella, iii. 208.
—— wageneriana, iii. 208.
Massowia lanceolata, iii. 428.
Mastigoscleria reflexa, iii. 470.
Matamoria spicata, ii. 76.
Mathurina, iv. 244.
MAURANDIA, ii. 441.
Maurandia antirrhiniflora, ii. 441.
—— barclayana, ii. 441.
—— erecta, ii. 441.
—— erubescens, ii. 441.
—— *personata*, ii. 441.
—— scandens, ii. 442.
—— semperflorens, ii. 442.
—— wislizeni, ii. 442.
MAURIA, i. 222.
Mauria puberula, i. 222.
—— *seemannii*, i. 222.
Mauritia, iv. 277.
MAXILLARIA, iii. 264.
Maxillaria, iii. 268; iv. 152, 213.
Maxillaria acervata, iii. 264.
—— aciantha, iii. 264.
—— *acutifolia*, iii. 267.
—— acutipetala, iii. 264.
—— *angustifolia*, iii. 267.
—— *aromatica*, iii. 253; iv. 301.
—— *articulata*, iii. 267.
—— atrata, iii. 264.
—— aurantiaca, iii. 264.
—— *biseriata*, iii. 253.

Maxillaria brachyglossa, iii. 264.
—— *brachypus*, iii. 252.
—— *brevispatha*, iii. 253.
—— *boothii*, iii. 226.
—— cæspitifica, iii. 264.
—— camardii, iii. 265.
—— *camaridium*, iv. 270.
—— *concava*, iii. 252.
—— crassifolia, iii. 265.
—— cruenta, iii. 265.
—— *cruenta*, iii. 254.
—— ctenostachys, iii. 265.
—— cucullata, iii. 265.
—— *cucullata*, iii. 266; iv. 302, 303.
—— curtipes, iii. 265.
—— cylindrobulba, iii. 265.
—— *densa*, iii. 270; iv. 302.
—— *deppei*, iii. 254; iv. 302.
—— elatior, iii. 265.
—— *elongata*, iii. 252.
—— friedrichsthalii, iii. 265.
—— *galeata*, iii. 255.
—— galeottiana, iii. 265.
—— glumibracteum, iii. 266.
—— *graminifolia*, iii. 265.
—— *hæmatochylum*, iv. 302.
—— *hæmatoglossa*, iv. 89.
—— *henchmanni*, iii. 267.
—— heraldica, iii. 266.
—— inaudita, iii. 266.
—— *liliacea*, iii. 250.
—— lindeniana, iii. 266.
—— *luteorubra*, iii. 266.
—— *lyncea*, iii. 258.
—— lyonii, iii. 266.
—— macleei, iii. 266.
—— *macrophylla*, iii. 254.
—— meleagris, iii. 266.
—— *nasalis*, iii. 266.
—— nasuta, iii. 266.
—— nigrescens, iii. 266.
—— obscura, iii. 266.
—— pumila, iii. 266.
—— puncto-striata, iii. 267.
—— reichenheimiana, iii. 267.
—— *revoluta*, iii. 267.
—— rhombea, iii. 267; iv. 89.
—— ringens, iii. 267.
—— *rubrofusca*, iii. 266.
—— rufescens, iii. 267.
—— *skinneri*, iii. 254.
—— *sordida*, iii. 253.
—— *stachyobiorum*, iii. 252.
—— sulfurina, iii. 267.
—— *superba*, iii. 250.
—— tenuifolia, iii. 267.
—— *triangularis*, iii. 265.
Maxillaria tricolor, iii. 255.
—— vaginalis, iii. 267.
—— variabilis, iii. 267; iv. 303.
—— *variabilis*, var. *impuncta*, iii. 267.
Maximiliana, i. 55.
Maximowiczia, iv. 100.
Maximowiczia lindheimeri, iv. 40.
—— tripartita, iv. 40.
Mayaca, iii. 385.
Mayaceæ, iv. 197.
MAYDEÆ, iii. 511.
MAYNA, i. 56.
Mayna laurina, i. 56.
MAYTENUS, i. 189.
Maytenus phyllanthoides, i. 189.
—— repandus, i. 189.
—— trichotomus, i. 189.
Mecosorus trilobus, iii. 671.
MEDEOLEÆ, iii. 381.
Medicago denticulata, i. 232.
—— *lupulina*, i. 232.
—— *sativa*, i. 232.
Megapterium dissectum, iv. 37.
Megastachya acutiflora, iii. 572.
—— *amœna*, iii. 572.
—— *breviflora*, iii. 576.
—— *capitata*, iii. 574.
—— *condensata*, iii. 578.
—— *corymbifera*, iii. 576.
—— *fasciculata*, iii. 576.
—— *gouini*, iii. 576.
—— *hypnoides*, iii. 576.
—— *montufari*, iii. 574.
—— *oxylepis*, iii. 574.
—— *panamensis*, iii. 574.
—— *panicoides*, iii. 574.
—— *prostrata*, iii. 578.
—— *reptans*, iii. 576.
—— *simpliciflora*, iii. 576.
—— *uninervia*, iii. 576.
MEGASTIGMA, i. 170.
Megastigma galeottii, i. 170.
—— skinneri, i. 170.
MEIRACYLLIUM, iii. 209.
Meiracyllium, iv. 269.
Meiracyllium gemma, iii. 209.
—— *gemma*, iv. 269.
—— trinasutum, iii. 209.
—— wendlandi, iii. 209.
MELAMPODIUM, ii. 144.
Melampodium, iv. 149.
Melampodium achillæoides, ii. 145.
—— americanum, ii. 145.
—— cinereum, ii. 145.
—— coronopifolium, ii. 145.
—— cupulatum, ii. 145.
Melampodium digynum, ii. 145.
—— divaricatum, ii. 145; iv. 103, 112.
—— flaccidum, ii. 145.
—— gracile, ii. 145.
—— heterophyllum, ii. 145.
—— hispidum, ii. 146.
—— *humile*, ii. 147.
—— kunthianum, ii. 146.
—— linearilobum, ii. 146.
—— longicorne, ii. 146.
—— microcephalum, ii. 146.
—— montanum, ii. 146.
—— *montanum*, iv. 288.
—— oblongifolium, ii. 146.
—— *ovatifolium*, ii. 145.
—— *paludosum*, ii. 145.
—— perfoliatum, ii. 146.
—— pumilum, ii. 146.
—— rhomboideum, ii. 146.
—— *ruderale*, ii. 171.
—— sericeum, ii. 146.
—— tenellum, ii. 147.
—— *ternatum*, ii. 198.
Melananthera, ii. 182.
Melananthera hastata, iv. 103.
Melanium anisophylla, i. 437.
Melanocarpum, iii. 11.
—— *sprucei*, iii. 12.
MELANTHERA, ii. 182.
Melanthera, iv. 231.
Melanthera deltoidea, ii. 182; iv. 112.
—— hastata, ii. 183.
—— lanceolata, ii. 183.
—— microphylla, ii. 183.
—— oxylepis, ii. 183.
MELASMA, ii. 456.
Melasma, iv. 231.
Melasma hispidum, ii. 456.
Melastoma, i. 423.
—— *albicans*, i. 424.
—— *arboreum*, i. 423.
—— *capitellata*, i. 430.
—— *caudata*, i. 425.
—— *diversifolia*, i. 432.
—— *fothergilla*, i. 425.
—— *glaucocarpum*, i. 427.
—— *granulosa*, i. 426.
—— *holosericea*, i. 424.
—— *ibaguensis*, i. 426.
—— *impetiolaris*, i. 426.
—— *lacera*, i. 426.
—— *lævigata*, i. 427.
—— *lineata*, i. 426.
—— *mexicana*, i. 419, 427.
—— *micranthum*, i. 432.
—— *minutiflora*, i. 427.

Melastoma octonum, i. 430.
—— *pendulifolia*, i. 427.
—— *quinquenervia*, i. 433.
—— rostrata, i. 435.
—— *rubiginosa*, i. 428.
—— *rubra*, i. 431.
—— umbilicata, i. 435.
—— *xalapensis*, i. 424.
MELASTOMACEÆ, i. 414; iv. 36.
Melastomaceæ, iv. 156, 180, 202, 217, 242.
MELASTOMEÆ, i. 415.
MELHANIA, i. 129.
Melhania abyssinica, i. 129.
—— ovata, i. 129.
Melia azedarach, iv. 98.
—— *azedarach*, i. 181.
MELIACEÆ, i. 181; iv. 98.
Meliaceæ, iv. 176, 203, 216, 230.
MELICA, iv. 95.
Melica imperfecta, iv. 95.
MELICOCCA, i. 213.
Melicocca bijuga, i. 213.
MELIEÆ, i. 181.
Melilotus parviflora, i. 232.
MELINIA, ii. 328.
Melinia, iv. 254.
Melinia angustifolia, ii. 328.
MELIOSMA, i. 216.
Meliosma, i. 217; iv. 229.
Meliosma alba, i. 216.
Meliphlea vitifolia, i. 114.
MELOCACTUS, i. 501.
Melocactus cephalophora, i. 502.
—— curvispinus, i. 502.
—— delessertianus, i. 502.
—— ferox, i. 502.
—— *ferox*, i. 538.
—— *ingens*, i. 533.
—— mammillariæformis, i. 502.
MELOCHIA, i. 130.
Melochia concinna, i. 132.
—— corymbosa, i. 130.
—— *domingensis*, i. 131.
—— hirsuta, i. 130.
—— *hirsuta*, i. 131.
—— inflata, i. 131.
—— interrupta, i. 131.
—— jurgensenii, i. 131.
—— melissæfolia, i. 131.
—— *melissæfolia*, iv. 230.
—— nodiflora, i. 131.
—— parvifolia, i. 131.
—— plicata, i. 131.
—— pyramidata, i. 131; iv. 97.
—— scutellarioides, i. 131.
—— serrata, i. 131.
Melochia tenella, i. 132.
—— tomentella, i. 132.
—— tomentosa, i. 132.
—— ——, var. ?, iv. 97.
MELOTHRIA, i. 484.
Melothria angustiloba, iv. 40.
—— fluminensis, iv. 40.
—— ——, var. ε. triangularis, iv. 40.
—— guadalupensis, iv. 40.
—— pendula, iv. 40.
—— *pendula*, iv. 245.
—— *pervaga*, i. 484.
—— scabra, i. 484.
Melvilla dodecandra, i. 440.
—— propinqua, i. 445.
Memecylon, iv. 242.
Mendezia bicolor, ii. 153, 192.
MENDONCIA, ii. 500.
Mendoncia costaricana, ii. 500.
MENISCIUM, iii. 679.
Meniscium angustifolium, iii. 679.
—— *falcatum*, iii. 679.
—— *jurgensenii*, iii. 679.
—— reticulatum, iii. 679.
—— serratum, iii. 679.
—— *sorbifolium*, iii. 679.
MENISPERMACEÆ, i. 20; iv. 3.
Menispermaceæ, iv. 171, 204, 214, 216.
MENODORA, ii. 304.
Menodora, ii. 303; iv. 231.
Menodora coulteri, ii. 304.
—— *coulteri*, iv. 67.
—— helianthemoides, ii. 304; iv. 67.
—— heterophylla, ii. 304.
—— longiflora, ii. 304; iv. 67.
—— mexicana, ii. 304.
—— scabra, ii. 304; iv. 67.
—— scoparia, ii. 304.
MENTHA, ii. 546.
Mentha, iv. 149.
—— *arvensis*, ii. 546.
—— canadensis, ii. 546.
—— *mexicana*, ii. 546.
—— *rotundifolia*, ii. 546.
MENTZELIA, i. 472.
Mentzelia, iv. 140, 233, 244.
—— aspera, iv. 38.
—— *aspera*, i. 472; iv. 233, 244.
—— *floridana*, iv. 244.
—— hispida, i. 472; iv. 38.
—— *hispida*, i. 473.
—— involucrata, iv. 38.
—— lobata, i. 472.
—— multiflora, iv. 38.
—— oligosperma, i. 473.
—— *oligosperma*, iv. 244.
Mentzelia stipitata, i. 473.
—— *stipitata*, i. 472.
—— strigosa, i. 473.
—— *strigosa*, iv. 38.
Menyanthes indica, ii. 353.
MERIANEÆ, i. 421.
MERIANIA, i. 421.
Meriania macrophylla, i. 421.
Merostachys racemiflora, iii. 586.
Mertensia bancroftii, iii. 590.
—— *commutata*, iii. 138.
—— *furcata*, iii. 590.
—— *glaucescens*, iii. 590.
—— gleichenoides, iii. 591.
—— *grandis*, iii. 590.
—— *hermanni*, iii. 590.
—— *iguanea*, iii. 138.
—— *immersa*, iii. 590.
—— *lævigata*, iii. 139.
—— *palmata*, iii. 590.
—— pectinata, iii. 590.
—— pubescens, iii. 590.
—— revoluta, iii. 591.
—— sartorii, iii. 591.
—— schaffneri, iii. 591.
—— *tomentosa*, iii. 590.
Mesechites andrieuxii, ii. 316.
—— *hirtellula*, ii. 317.
—— *jasminiflora*, ii. 314.
—— *oaxacana*, ii. 317.
—— *rosea*, ii. 315.
—— *torulosa*, ii. 315.
Mesembryanthemum, i. 555; iv. 212.
Mesoneuris bipinnatifida, ii. 237.
Mesospinidium warscewiczii, iii. 278.
Mespilus pubescens, i. 380.
—— *stipulosa*, i. 380.
Messerschmidia candida, ii. 372.
—— *chrysantha*, ii. 372.
METASTELMA, ii. 327.
Metastelma angustifolium, ii. 327.
—— *angustifolium*, ii. 328; iv. 70.
—— arizonicum, iv. 69.
—— barbigerum, ii. 327.
—— californicum, iv. 69.
—— cubense, ii. 327.
—— *cubense*, iv. 69.
—— palmeri, iv. 69.
—— parviflorum, ii. 327; iv. 113.
—— pedunculare, ii. 327.
—— schlechtendalii, ii. 327.
Metopeum linnæi, iv. 98.
Metrosideros, iv. 233, 241.
—— *angustifolia*, iv. 241.
Meyenia corymbosa, ii. 431.
—— *fasciculata*, ii. 431.

Mezierea, i. 493.
MICONIA, i. 424.
Miconia, iv. 159, 213, 242, 243, 299.
—— *æruginosa*, i. 425.
—— albicans, i. 424.
—— alternans, i. 424.
—— *anceps*, i. 428.
—— anisotricha, i. 425.
—— argentea, i. 425.
—— *argyrophylla*, i. 428.
—— *astrolasia*, i. 428.
—— *attenuata*, i. 428.
—— *auriculata*, iv. 166.
—— *barbigera*, i. 425.
—— barbinervis, i. 425.
—— beurlingii, i. 425.
—— *brachystyla*, i. 426.
—— caudata, i. 425.
—— *chætodon*, i. 425.
—— chrysoneura, i. 425.
—— *cinnamomea*, i. 422.
—— *collina*, i. 428.
—— *congestiflora*, i. 425.
—— decussata, i. 425.
—— *decussata*, iv. 242.
—— desmantha, i. 425.
—— erythrantha, i. 425.
—— *erythrantha*, iv. 285.
—— fothergilla, i. 425.
—— glaberrima, i. 426.
—— globulifera, i. 426.
—— gracilis, i. 426.
—— granulosa, i. 426.
—— hemenostigma, i. 426.
—— *hexaptera*, i. 429.
—— *holosericea*, i. 424.
—— *hypargyrea*, i. 428.
—— hyperprasina, i. 426.
—— ibaguensis, i. 426.
—— *ibaguensis*, i. 427; iv. 242.
—— impetiolaris, i. 426.
—— *impetiolaris*, iv. 166, 242.
—— lacera, i. 426.
—— *lacera*, iv. 242.
—— lævigata, i. 427.
—— *lævigata*, iv. 242.
—— *lindenii*, i. 425.
—— lonchophylla, i. 427.
—— *longistyla*, i. 425.
—— magnifica, i. 427.
—— maximiliana, i. 427.
—— *melanodendron*, i. 427.
—— mexicana, i. 427.
—— *microphylla*, i. 428.
—— minutiflora, i. 427.
—— *minutiflora*, iv. 242.
Miconia myriantha, i. 427.
—— *myriocarpa*, i. 426.
—— nervosa, i. 427.
—— *nervosa*, iv. 242.
—— oligotricha, i. 427.
—— phæotricha, i. 428.
—— *pileata*, i. 425.
—— pinetorum, i. 428.
—— planinervia, i. 428.
—— prasina, i. 428.
—— *prasina*, i. 429; iv. 242.
—— *procera*, i. 425.
—— *pteropoda*, i. 424, 428.
—— *purpurascens*, i. 419.
—— *pusilliflora*, i. 425.
—— rubiginosa, i. 428.
—— schlimii, i. 428.
—— scorpioides, i. 428.
—— *sepiaria*, i. 428.
—— stenostachya, i. 428.
—— *stenostachya*, iv. 242.
—— *sylvatica*, i. 427.
—— triplinervis, i. 429.
—— umbilicata, i. 429.
—— umbrifera, i. 429.
MICONIEÆ, i. 422.
MICRANTHEMUM, ii. 543.
Micranthemum orbiculatum, ii. 453.
MICREMBRYEÆ, iii. 44.
MICROCHLOA, iii. 557.
Microchloa setacea, iii. 557.
Microgonium schaffneri, iii. 603.
Microlæna, iii. 531.
Microlepia arcuata, iii. 605.
—— *boryana*, iii. 605.
—— *caudata*, iii. 605.
—— *galeottii*, iii. 605.
—— inæqualis, iii. 605.
—— saccoloma, iii. 605.
MICROLICEÆ, i. 415.
Microlobium glandulosum, i. 235.
MICROMERIA, ii. 547.
Micromeria, ii. 550.
—— *boliviana*, ii. 550.
—— brownei, ii. 547; iv. 107.
—— stonolifera, ii. 547.
—— xalapensis, ii. 547.
Micropetalon lanuginosum, i. 69.
Micropiper langsdorffii, iii. 61.
—— *melanostigma*, iii. 62.
—— *pellucidum*, iii. 63.
MICROPLEURA, i. 558.
Micropleura renifolia, i. 558.
MICROPUS, ii. 134.
Micropus grayana, ii. 135.
Micropyxis pumila, ii. 289.
MICRORHAMNUS, i. 196.
Microrhamnus, iv. 229.
Microrhamnus ericoides, i. 196; iv. 22.
—— *ericoides*, iv. 140.
MICROSCHWENKIA, ii. 438.
Microschwenkia guatemalensis, ii. 438.
MICROSECHIUM, i. 491.
Microsechium guatemalense, i. 491.
—— *guatemalense*, iv. 42, 285.
—— helleri, iv. 42.
—— palmatum, iv. 42.
—— ruderale, i. 492.
—— *ruderale*, iv. 42, 286.
MICROSERIS, ii. 260.
Microseris, iv. 234.
Microseris linearifolia, ii. 260.
Microsperma lobata, i. 472.
—— *rudis*, i. 472.
MICROSPERMÆ, iii. 196.
MICROSPERMUM, ii. 215.
Microspermum debile, ii. 215.
—— *debile*, iv. 288.
—— nummulariæfolium, ii. 215.
MICROSPLENIUM, ii. 4.
Microsplenium, iv. 248.
Microsplenium coulteri, ii. 4.
MICROSTYLIS, iii. 209.
Microstylis, iii. 211; iv. 271.
Microstylis brachystachys, iii. 209.
—— *cochleariæfolia*, iii. 210.
—— cordata, iii. 209.
—— crispata, iii. 209.
—— crispifolia, iii. 210.
—— erhrenbergii, iii. 210.
—— excavata, iii. 210.
—— fastigiata, iii. 210.
—— *fastigiata*, iv. 294.
—— hastilabia, iii. 210.
—— *hastilabia*, iv. 294.
—— histionantha, iii. 210.
—— ichthyorrhyncha, iii. 210.
—— lagotis, iii. 210.
—— *lagotis*, iv. 294.
—— macrostachya, iii. 210.
—— *macrostachya*, iv. 294.
—— majanthemifolia, iii. 210.
—— myurus, iii. 210.
—— *ophioglossoides*, iv. 269.
—— ——, var. *mexicana*, iii. 211.
—— *parthoni*, iii. 210.
—— simillima, iii. 211.
—— tipuloides, iii. 211.
—— umbellulata, iii. 211.
—— *umbellulata*, iv. 294, 270.
MICROTEA, iii. 29.

Microtea debilis, iii. 29; iv. 114.
MIKANIA, ii. 102.
Mikania, iv. 252.
Mikania ambigua, ii. 103.
—— angulata, ii. 103.
—— coriacea, ii. 103.
—— denticulata, ii. 103.
—— eriophora, ii. 103.
—— fendleri, iv. 51.
—— gonoclada, ii. 103.
—— *gonoclada*, iv. 51.
—— guaco, ii. 103.
—— hookeriana, ii. 103.
—— houstonis, ii. 103.
—— leiostachya, ii. 103.
—— pterocaula, ii. 103.
—— repanda, ii. 103.
—— scandens, ii. 104.
—— suaveolens, ii. 104.
—— tlalixcoyan, ii. 104.
Milium lanatum, iii. 483.
—— *mexicanum*, iii. 538.
—— *microspermum*, iii. 543.
—— *sparsum*, iii. 543, 485.
MILLA, iii. 377.
Milla biflora, iii. 377.
MILLERIA, ii. 141.
Milleria, iv. 119.
—— *angustifolia*, ii. 216.
—— *biflora*, ii. 141.
—— *contrayerba*, ii. 216.
—— *dichotoma*, ii. 141.
—— *glandulosa*, ii. 141.
—— quinqueflora, ii. 141.
Millingtonia alba, i. 216.
Miltonia karwinskii, iii. 275.
MIMOSA, i. 346.
Mimosa, iv. 143, 146, 147, 164, 213.
Mimosa acanthocarpa, i. 346.
—— adenantheroides, i. 346.
—— *adenantheroides*, iv. 284.
—— albida, i. 346.
—— arcuata, i. 346.
—— asperata, i. 346; iv. 112.
—— *asperata*, iv. 230.
—— berlandieri, i. 347.
—— biuncifera, i. 346.
—— borealis, i. 347.
—— cabrera, i. 347.
—— calcarea, i. 344.
—— camporum, i. 347.
—— costaricensis, i. 347.
—— *costaricensis*, iv. 112.
—— *cyclocarpa*, i. 361.
—— debilis, i. 347.
—— depauperata, i. 347.
Mimosa distachya, i. 347.
—— dormiens, i. 347.
—— *dulcis*, i. 359.
—— ervendbergii, i. 347.
—— *fagifolia*, i. 362.
—— fasciculata, i. 347.
—— flexuosa, i. 347.
—— *flexuosa*, i. 348.
—— floribunda, i. 348.
—— *fœtida*, i. 343.
—— galeottii, i. 348.
—— geminata, i. 348.
—— *glandulosa*, i. 345.
—— grahami, i. 348.
—— guatemalensis, i. 348.
—— *hirsuta*, i. 349.
—— *horridula*, i. 351.
—— invisa, i. 348.
—— lactiflua, i. 349.
—— *lacustris*, i. 345.
—— laxiflora, i. 349.
—— lemmoni, iv. 32.
—— leucænoides, i. 349.
—— lindheimeri, i. 349.
—— malacophylla, i. 349.
—— mollis, i. 349.
—— monancistra, i. 349; iv. 32.
—— *monilifera*, i. 359.
—— panamensis, i. 347.
—— *plana*, i. 354.
—— platycarpa, i. 349.
—— *podocarpa*, i. 350.
—— polyantha, i. 349.
—— *portoricensis*, i. 358.
—— puberula, i. 349.
—— pudica, i. 349; iv. 112.
—— *pudica*, iv. 162, 166.
—— *pumila*, i. 346.
—— pusilla, i. 349.
—— *racemosa*, i. 348.
—— *scandens*, i. 343.
—— *semialata*, i. 363.
—— *sensitiva*, iv. 147.
—— skinneri, i. 349.
—— somnians, i. 350.
—— strigillosa, i. 350; iv. 32.
—— tenuiflora, i. 350.
—— tricephala, i. 350.
—— trijuga, i. 350.
—— velloziana, i. 350.
—— *viva*, i. 350.
—— wrightii, i. 350.
—— zygophylla, i. 350.
MIMOSEÆ, i. 342.
Mimoseæ, i. 351, 352; iv. 178.
MIMULUS, ii. 448.
Mimulus, iv. 150.
Mimulus cardinalis, ii. 449.
—— glabratus, ii. 449; iv. 76.
—— *glabratus*, iv. 149, 291.
—— *guttatus*, ii. 449.
—— jamesii, ii. 449.
—— luteus, ii. 449.
—— madrensis, ii. 449.
—— orizabæ, ii. 449.
—— *orizabæ*, iv. 291.
—— *perfoliatus*, ii. 448.
—— pubescens, ii. 449.
—— *rivularis*, ii. 449.
—— *variegatus*, ii. 449.
Mina, iv. 256.
—— *lobata*, ii. 395.
MINKELERSIA, i. 308.
Minkelersia biflora, i. 308.
—— galactioides, ii. 308.
MIRABILIS, iii. 1.
Mirabilis aggregata, iii. 2.
—— coccinea, iii. 1.
—— *corymbosa*, iii. 3.
—— dichotoma, iii. 1.
—— hybrida, iii. 1.
—— jalapa, iii. 1.
—— longiflora, iii. 2.
—— multiflora, iii. 2.
—— *suaveolens*, iii. 2.
—— triflora, iii. 2.
—— *viscosa*, iii. 3.
Miradoria sartorii, ii. 215.
MIRASOLIA, ii. 167.
Mirasolia, ii. 168.
Mirasolia calva, ii. 168.
—— diversifolia, ii. 168.
—— scaberrima, ii. 168.
MISANTECA, iii. 70.
Misanteca capitata, iii. 71.
MITCHELLA, ii. 54.
Mitchella, iv. 229.
Mitchella repens, ii. 54.
Mitozus mexicanus, ii. 312.
MITRACARPUM, ii. 61.
Mitracarpum, iv. 231, 249.
Mitracarpum angustifolium, ii. 61.
—— breviflorum, ii. 61; iv. 48.
—— pallidum, ii. 61.
—— schizangium, ii. 61.
—— villosum, ii. 61.
MITRANTHES, i. 413.
Mitranthes sartoriana, i. 413.
MITRARIA, ii. 488.
Mitraria pallida, ii. 489.
—— tomentella, ii. 489.
MITREOLA, ii. 340.
Mitreola petiolata, ii. 340.
MITREPHOREÆ, i. 17.

Mitrospora polyphylla, iii. 467.
Mocinna brachiata, ii. 205.
—— *serrata*, ii. 205.
MODIOLA, i. 114.
Modiola caroliniana, ii. 114.
—— *caroliniana*, iv. 283.
—— *multifida*, i. 114.
Mœhringia nemorosa, i. 69.
MOGIPHANES, iii. 15.
Mogiphanes multicaulis, iii. 16.
—— *pilosa*, iii. 18.
—— straminea, iii. 16; iv. 107.
Mohria, iii. 692.
MOLLINEDIA, iii. 68.
Mollinedia, iv. 234.
Mollinedia glabra, iii. 68.
—— laurina, iii. 68.
—— nigrescens, iii. 68.
—— viridiflora, iii. 68.
MOLLUGINEÆ, i. 556.
MOLLUGO, i. 556.
Mollugo arenaria, i. 556.
—— *dichotoma*, i. 556.
—— *glinoides*, i. 556.
—— glinus, i. 556.
—— schrankii, i. 556.
—— verticillata, i. 556.
—— *verticillata*, iv. 233.
Momisia anfractuosa, iii. 239.
—— *ehrenbergiana*, iii. 138.
MOMORDICA, i. 482.
Momordica balsamina, i. 482.
—— charantia, i. 482; iv. 100.
—— *pedata*, i. 490.
—— *quinquefida*, i. 483.
Monachanthus, iii. 260, 261, 262.
Monachanthus dilectum, iii. 260.
MONANTHOCHLOE, iii. 572.
Monanthochloe, iv. 280.
Monanthochloe littoralis, iii. 572.
—— *littoralis*, iv. 279.
MONARDA, ii. 567.
Monarda aristata, ii. 567.
—— citriodora, ii. 567.
—— fistulosa, ii. 567.
Monechma pilosella, ii. 516.
MONIMIACEÆ, iii. 68.
Monimiaceæ, iv. 191, 204, 234.
MONNINA, i. 63.
Monnina angustifolia, i. 63.
—— bifurcata, i. 63.
—— ciliolata, i. 63.
—— evonymoides, i. 63.
—— *jalapensis*, iv. 149.
—— pterocarpa, i. 63.
—— sylvatica, i. 63.
—— xalapensis, i. 63.
Monnina xalapensis, iv. 283.
MONOCHÆTUM, i. 420.
Monochætum, iv. 243.
Monochætum alpestre, i. 420.
—— *alpestre*, iv. 243, 285.
—— bracteolatum, i. 420.
—— calcaratum, i. 420.
—— *calcaratum*, iv. 242.
—— deppeanum, i. 420.
—— *ensiferum*, i. 420.
—— *humboldtianum*, i. 420.
—— myrtoideum, i. 420.
—— *plumosum*, i. 420.
—— *pulchellum*, i. 420.
—— pulchrum, i. 420.
—— rivulare, i. 421.
—— tenellum, i. 421.
—— *triplinerve*, i. 420.
MONOCOTYLEDONES, iii. 196.
Monocotyledones, iv. 201, 208, 209, 218, 219, 223, 227.
MONOGRAMME, iii. 675.
Monogramme graminifolia, iii. 676.
—— immersa, iii. 675.
—— myrtillifolia, iii. 675.
—— rostrata, iii. 675.
—— seminuda, iii. 676.
Monopanax ghiesbreghtii, iv. 46.
Monopogon avenaceus, iii. 557.
MONOPYLE, ii. 472.
Monopyle costaricana, ii. 472.
—— macrocarpa, ii. 472.
Monosis foliosa, ii. 72.
—— *salicifolia*, ii. 73.
—— *tarchonanthifolia*, ii. 74.
—— *tomentosa*, ii. 72, 73.
MONOTROPA, ii. 285.
Monotropa, iv. 229.
—— *coccinea*, ii. 285; iv. 262.
—— *hypopitys*, ii. 285.
—— uniflora, ii. 285.
MONOTROPEÆ, ii. 284.
Monotropeæ, iv. 185, 205, 215, 217, 225, 226.
Monroa, iii. 572.
MONSTERA, iii. 426.
Monstera, iv. 278.
Monstera acuminata, iii. 426.
—— *adansonii*, iii. 427.
—— *borsigiana*, iii. 426.
—— deliciosa, iii. 426.
—— dilacerata, iii. 426.
—— egregia, iii. 426.
—— friedrichsthaliana, iii. 427.
—— *karwinskyi*, iii. 426.
—— *lennea*, iii. 426.
—— pertusa, iii. 427.
Monstera punctulata, iii. 427.
—— seemannii, iii. 427.
Montagnæa, ii. 164.
Montagnæa ensifolia, ii. 161.
—— *hibiscifolia*, iv. 157.
MONTANOA, ii. 164.
Montanoa arborescens, ii. 164.
—— aschenbornii, ii. 165.
—— *atriplicifolia*, ii. 164.
—— bipinnatifida, ii. 165.
—— clematidea, ii. 165.
—— crenata, ii. 165.
—— elegans, ii. 165.
—— floribunda, ii. 165.
—— frutescens, ii. 165.
—— gracilis, ii. 165.
—— grandiflora, ii. 165.
—— *heracleifolia*, ii. 165.
—— *heterophylla*, ii. 166.
—— hibiscifolia, ii. 165.
—— karwinskii, ii. 165.
—— microcephala, ii. 166.
—— mollissima, ii. 166.
—— olivæ, ii. 166.
—— pyramidata, ii. 166.
—— speciosa, ii. 166.
—— ternifolia, ii. 166.
—— thomasii, iv. 56.
—— tomentosa, ii. 166.
—— *tomentosa*, var. *ternifolia*, ii. 166.
—— triloba, ii. 166.
—— uncinata, ii. 166.
—— xanthiifolia, ii. 166.
MONTEZUMA, i. 125.
Montezuma, iv. 237.
Montezuma speciosissima, i. 125.
MONTIA, i. 81.
Montia fontana, i. 81.
MONTRICHARDIA, iii. 424.
Montrichardia fendleri, iii. 424.
MOQUILEA, i. 365.
Moquilea kunthiana, i. 367.
—— platypus, i. 366.
MOQUINIA, ii. 254.
Moquinia hypoleuca, ii. 254.
Moræa acorifolia, iii. 325, 329.
—— *chimboracensis*, iii. 329.
—— *foliosa*, iii. 328.
MOREÆ, iii. 140.
Morelosia huanita, ii. 370.
Morenia ernesti-augusti, iii. 404.
—— *oblongata*, iii. 406.
Morenoa globosa, ii. 389, 391.
—— *grandiflora*, ii. 389.
MORINDA, ii. 46.
Morinda citrifolia, iv. 233.
—— panamensis, ii. 46.

Morinda roioc, ii. 46; iv. 102.
MORINDEÆ, ii. 46.
Moringeæ, iv. 178.
MORMODES, iii. 261.
Mormodes, iv. 152, 302.
Mormodes aromaticum, iii. 261.
—— atropurpureum, iii. 261.
—— *atropurpureum*, iii. 262.
—— *barbatum*, iii. 262.
—— *brachystachyum*, iii. 261.
—— buccinator, iii. 261.
—— *buccinator*, iii. 262.
—— colossus, iii. 262.
—— *colossus*, iv. 295.
—— *flavidum*, iii. 261.
—— fractiflexum, iii. 262.
—— *greenii*, iii. 262.
—— hookeri, iii. 262.
—— igneum, iii. 262.
—— *lentiginosum*, iii. 261.
—— *leuchochilum*, iii. 261.
—— lineatum, iii. 262.
—— luxatum, iii. 262.
—— *macranthum*, iii. 262.
—— *marmoreum*, iii. 261.
—— pardinum, iii. 269.
—— *pardinum*, iv. 300.
—— ——, var. *unicolor*, iii. 262.
—— skinneri, iii. 262.
—— uncia, iii. 262.
—— *vitellinum*, iii. 261.
—— *wagenerianum*, iii. 261.
—— *warscewiczii*, iii. 262.
—— wendlandi, iii. 262.
MORMOLYCE, iii. 264.
Mormolyce lineolata, iii. 264.
Moronobea coccinea, i. 87.
—— *globulifera*, i. 87.
MORTONIA, i. 191.
Mortonia crassifolia, iv. 141.
—— effusa, i. 191.
—— *effusa*, iv. 21.
—— greggii, i. 191; iv. 21.
—— palmeri, i. 191.
—— *palmeri*, iv. 21.
—— scabrella, i. 191; iv. 21.
MORUS, iii. 141.
Morus, iv. 309, 312.
Morus celtidifolia, iii. 141.
—— *mexicana*, iii. 141.
—— *rubra*, iii. 141.
—— tinctoria, iii. 141.
—— *xanthoxylon*, iii. 141
Moschoxylon cuneatum, i. 182.
—— *veraguense*, i. 182, 222.
Mougeotia inflata, i. 131.
MOURIRIA, i. 434.
Mouriria, iv. 242.
—— *acuta*, i. 434.
—— mexicana, i. 434.
—— parvifolia, i. 434; iv. 36.
MOURIRIEÆ, i. 434.
Moussonia, ii. 487.
—— *costaricensis*, ii. 478.
—— *deppeana*, ii. 478.
—— *elegans*, ii. 478.
—— *formosa*, ii. 478.
Moutouchi suberosa, i. 316.
Mozinna canescens, iii. 106.
—— *cardiophylla*, iii. 106.
—— *cinerea*, iii. 106.
—— *cordata*, iii. 106.
—— *spathulata*, iii. 108.
—— ——, *β. sessiliflora*, iii. 108.
MUCUNA, i. 300.
—— altissima, i. 300.
—— mutisiana, i. 300.
—— urens, i. 300.
MUEHLENBECKIA, iii. 35.
Muehlenbeckia, iv. 234, 259.
—— *benthamii*, iii. 36.
—— *quadrangulata*, iii. 36.
—— tamnifolia, iii. 36.
—— *tamnifolia*, iv. 293.
—— *volcanica*, iii. 36.
—— vulcanica, iii. 36.
MUEHLENBERGIA, iii. 538.
Muehlenbergia, iii. 543; iv. 213.
—— acutifolia, iii. 538.
—— affinis, iii. 538.
—— anomala, iii. 539.
—— berlandieri, iii. 539.
—— botteri, iii. 539.
—— bourgæi, iii. 539.
—— breviseta, iii. 539.
—— calamagrostidea, iii. 539.
—— *capillaris*, iii. 542.
—— ciliata, iii. 539.
—— clomena, iii. 539.
—— debilis, iii. 540.
—— *divaricata*, iii. 533.
—— distichophylla, iii. 540.
—— *diversiglumis*, iii. 543.
—— dubia, iii. 540.
—— erecta, iii. 540.
—— exilis, iii. 540.
—— expansa, iii. 541.
—— glabrata, iii. 541.
—— *glabrata*, iv. 296.
—— gracilis, iii. 541.
—— implicata, iii. 541.
—— liebmannii, iii. 541.
—— *longiseta*, iii. 539.
—— *mexicana*, iii. 551.
Muehlenbergia microsperma iii. 540.
—— mucronata, iii. 541.
—— *mucronata*, iii. 540; iv. 296.
—— *pusilla*, iii. 540.
—— quadridentata, iii. 541.
—— *quadridentata*, iv. 296.
—— rigida, iii. 542.
—— scabra, iii. 542.
—— *scabra*, iii. 534.
—— schaffneri, iii. 542.
—— setarioides, iii. 542.
—— *setosa*, iii. 540.
—— spiciformis, iii. 542.
—— stipoides, iii. 542.
—— *stipoides*, iv. 296.
—— stricta, iii. 542.
—— subtilis, iii. 542.
—— tenella, iii. 542.
—— *tenella*, iii. 540.
—— tenuifolia, iii. 543.
—— *tenuis*, iii. 535.
—— tenuissima, iii. 543.
—— *trichopodes*, iii. 538.
—— trinii, iii. 543.
—— virescens, iii. 543; iv. 95.
MUELLERA, i. 319.
Muellera mexicana, i. 320.
—— moniliformis, i. 320.
MULINEÆ, i. 558.
MULTOVULATÆ AQUATICÆ, iii. 38.
—— TERRESTRES, iii. 40.
Munroa squarrosa, iii. 572.
MUNTINGIA, i. 140.
Muntingia calabura, i. 140; iv. 111.
Murraya exotica, iv. 97.
Musa, iii. 312.
—— *bihai*, iii. 312.
—— *paradisiaca*, iii. 312.
—— *sapientum*, iii. 312.
MUSEÆ, iii. 312.
Mussænda formosa, ii. 40.
MUSSÆNDEÆ, ii. 31.
Mustelia eupatoria, ii. 86.
MUTISIACEÆ, ii. 253.
Mutisiaceæ, iv. 184.
Myanthus, iii. 260.
MYGINDA, i. 189.
Myginda coccinea, i. 189.
—— latifolia, i. 189.
—— pallens, iv. 98.
—— *rhacoma*, iv. 98.
—— uragoga, i. 189.
Myoporineæ, iv. 189.
Myopsia, ii. 269.
—— *mexicana*, ii. 270.
Myosotis albida, iv. 72.

Myosotis grandiflora, iv. 72.
MYOSURUS, i. 5.
Myosurus aristatus, i. 5.
—— minimus, i. 5.
MYRCIA, i. 407.
Myrcia acuminata, i. 408.
—— *aromatica*, i. 409.
—— costaricensis, i. 468.
—— cucullata, i. 408.
—— discolor, i. 408.
—— melanoclada, i. 408.
—— œrstediana, i. 408.
—— plicato-costata, i. 408.
—— sartoriana, i. 408.
MYRICA, iii. 164.
Myrica lindeniana, iii. 164.
—— *polycarpa*, iii. 164.
—— xalapensis, iii. 164.
MYRICACEÆ, iii. 164.
Myricaceæ, iv. 193, 205.
MYRIOCARPA, iii. 159.
Myriocarpa ambigua, iii. 160.
—— bifurca, iii. 159.
—— colipensis, iii. 160.
—— cordifolia, iii. 160.
—— *cordifolia, β. colipensis*, iii. 160.
—— *humilis*, iii. 160.
—— inæquilatera, iii. 160.
—— longipes, iii. 160.
—— stipitata, iii. 160.
MYRIOPHYLLUM, i. 401.
Myriophyllum heterophyllum, i. 401.
Myriopteris cheiloglyphis, iii. 613.
—— *elegans*, iii. 616.
—— *fendleri*, iii. 614.
—— *intermedia*, iii. 617.
—— *lanuginosa*, iii. 614.
—— *lindheimeri*, iii. 615.
—— *marsupianthes*, iii. 614.
—— *myriophylla*, iii. 615.
—— *paleacea*, iii. 615.
—— *rufa*, iii. 613.
—— *scariosa*, iii. 616.
—— *villosa*, iii. 614.
MYRISTICA, iii. 66.
Myristica cuspidata, iii. 68.
—— guatemalensis, iii. 66.
—— mexicana, iii. 67.
—— panamensis, iii. 67.
—— *sebifera*, iii. 67, 68.
MYRISTICACEÆ, iii. 66.
Myristicaceæ, iv. 191.
MYRODIA, i. 127.
Myrodia, i. 128.
Myrodia funebris, i. 127.
—— turbinata, i. 127.
Myrodia verticillaris, i. 127.
Myrospermum pereiræ, i. 322.
MYROXYLON, i. 322.
Myroxylon pereiræ, i. 322.
—— *punctatum*, i. 322.
—— toluiferum, i. 322.
Myrrhis andina, i. 567.
MYRSINE, ii. 289.
Myrsine, iv. 299.
—— *ardisioides*, ii. 293.
—— myricoides, ii. 289.
—— *myricoides*, iv. 290.
—— pellucido-punctata, ii. 290.
—— penduliflora, ii. 290.
—— *penduliflora*, iv. 290.
—— rapanea, ii. 290.
—— *rapanea*, iv. 157.
—— serrata, ii. 290.
—— *serrata*, iv. 290.
MYRSINEÆ, ii. 289; iv. 104.
Myrsineæ, iv. 186, 203, 215, 217.
MYRTACEÆ, i. 405; iv. 100.
Myrtaceæ, iv. 136, 180, 203, 217, 241.
MYRTEÆ, i. 405.
MYRTUS, i. 407.
Myrtus arayan, i. 407.
—— berlandieriana, i. 407.
—— *bullata*, i. 408.
—— ehrenbergii, i. 407.
—— maritima, i. 407.
—— montana, i. 407.
—— œrstedii, i. 407.
—— *œrstedii*, iv. 285.
—— *tabasco*, i. 409.
—— *trunciflora*, i. 411.
—— *xalapensis*, i. 411.

NÆGELIA, ii. 476.
Nægelia amabilis, ii. 476.
—— cinnabarina, ii. 476.
—— geroltiana, ii. 476.
—— multiflora, ii. 476.
—— punctata, ii. 476.
—— secunda, ii. 476.
—— zebrina, ii. 476.
Nagelia denticulata, i. 380.
NAIADACEÆ, iii. 440; iv. 93.
Naiadaceæ, iv. 199, 204, 217, 226.
NAIAS, iii. 442.
Naias canadensis, iii. 442.
—— flexilis, iii. 442.
NAMA, ii. 360.
Nama, ii. 361; iv. 255.
Nama angustifolium, ii. 364.
Nama *berlandieri*, ii. 364.
—— biflorum, ii. 365.
—— coulteri, ii. 364; iv. 71.
—— *demissum*, ii. 362, 364.
—— dichotomum, ii. 364.
—— *echioides*, ii. 364.
—— hirsutum, ii. 362.
—— *hirsutum*, iv. 291.
—— hispidulum, ii. 363.
—— hispidum, ii. 364.
—— *hispidum*, ii. 361; iv. 71.
—— jamaicense, ii. 365; iv. 113.
—— *jamaicense*, ii. 360, 361; iv. 255.
—— latifolium, ii. 363.
—— *latifolium*, iv. 291.
—— *lobbii*, ii. 360, 362.
—— *longiflorum*, ii. 362.
—— macranthum, ii. 364.
—— origanifolium, ii. 362.
—— palmeri, ii. 361.
—— *palmeri*, ii. 360, 362.
—— *parryi*, ii. 360.
—— *rothrockii*, ii. 360.
—— rotundifolium, ii. 363.
—— rupicolum, ii. 362.
—— *rupicolum*, ii. 363.
—— *sandwicensis*, ii. 364.
—— schaffneri, ii. 361.
—— *schaffneri*, ii. 360.
—— sericeum, ii. 362.
—— serpylloides, ii. 363.
—— stenocarpum, ii. 365; iv. 71.
—— *stenocarpum*, ii. 361.
—— stenophyllum, ii. 361.
—— *stenophyllum*, ii. 360; iv. 71.
—— subpetiolare, ii. 365.
—— undulatum, ii. 364.
—— *undulatum*, ii. 361, 365.
NARTHECIEÆ, iii. 381.
NASTURTIUM, i. 28.
Nasturtium arabiforme, i. 28.
—— *arabiforme*, iv. 282.
—— impatiens, i. 29.
—— *impatiens*, iv. 149, 282.
—— mexicanum, i. 29.
—— *micropetalum*, i. 29.
—— obtusum, i. 29.
—— officinale, i. 29.
—— orizabæ, i. 29; iv. 5.
—— *orizabæ*, iv. 150, 282.
—— palustre, i. 29.
—— plebejum, i. 29.
—— tanacetifolium, i. 29.
Nauclea aculeata, ii. 6.
—— *tomentosa*, ii. 6.
NAUCLEÆ, ii. 6.

Nauenia spectabilis, iii. 253.
Nautilocalyx panamensis, ii. 475.
Navarretia schottii, ii. 355.
Navicularia, iii. 500.
NECTANDRA, iii. 74.
Nectandra amazonum, iii. 74.
—— attenuata, iii. 74.
—— cuspidata, iii. 74.
—— glabrescens, iii. 74.
—— intermedia, iii. 75.
—— lanceolata, iii. 75.
—— laurel, iii. 74.
—— limbata, iii. 74.
—— mexicana, iii. 75.
—— mollis, iii. 74.
—— œrstedii, iii. 75.
—— pallida, iii. 75.
—— polita, iii. 75.
—— sanguinea, iii. 75.
—— striata, iii. 75.
—— turbacensis, iii. 75.
—— venosa, iii. 75.
—— villosa, iii. 75.
—— willdenowiana, iii. 75; iv. 108, 114.
NECTOUXIA, ii. 425.
Nectouxia bella, ii. 425.
—— formosa, ii. 425.
—— *formosa*, iv. 291.
NEEA, iii. 9.
Neea, iv. 258.
NEGUNDO, i. 214.
Negundo, iv. 229.
Negundo aceroides, iv. 23.
—— *aceroides*, i. 214.
—— mexicanum, i. 214; iv. 24.
Neippergia chrysantha, iii. 259.
NELSONIA, ii. 501.
Nelsonia campestris, ii. 501.
—— *campestris*, iv. 258.
—— *canescens*, ii. 501.
—— *nummulariæfolia*, ii. 501.
—— *pohlii*, ii. 501.
—— *rotundifolia*, ii. 501.
—— *tomentosa*, ii. 501.
—— *villosa*, ii. 501.
NEMACLADUS, ii. 270.
Nemacladus, iv. 253.
Nemacladus ramosissimus, ii. 270.
Nemaconia graminifolia, iii. 223.
NEMASTYLIS, iii. 328.
Nemastylis cœlestina, iii. 329.
—— multiflora, iii. 328.
—— nana, iii. 329.
—— punctata, iii. 329.
—— tenuis, iii. 329.
—— triflora, iii. 329.
NEOHALLIA, ii. 519.
Neohallia borreræ, ii. 519.
Neottia aurantiaca, iii. 300; iv. 148.
—— *cinnabarina*, iii. 300.
—— *glandulosa*, iii. 299.
—— *michuacana*, iii. 301.
—— *micrantha*, iii. 301.
—— *orchioides*, iii. 301.
—— *papulosa*, iv. 89.
—— *plantaginea*, iii. 302.
—— *speciosa*, iii. 300.
—— *squamulosa*, iii. 302.
—— *sulphurea*, iii. 302.
NEOTTIEÆ, iii. 294.
Neottieæ, iv. 195.
Nepenthaceæ, iv. 191.
Nepeta circinata, ii. 572.
—— *pectinata*, ii. 544.
NEPHRADENIA, ii. 336.
Nephradenia, iv. 254.
Nephradenia neriifolia, ii. 336.
NEPHRODIUM, iii. 644.
Nephrodium, iv. 213.
Nephrodium amplum, iii. 644.
—— athyrioides, iii. 644.
—— *bourgæi*, iii. 644.
—— brachyodon, iii. 644.
—— caripense, iii. 645.
—— chontalense, iii. 645.
—— cicutarium, iii. 645.
—— concinnum, iii. 645.
—— *conspersum*, iii. 650.
—— conterminum, iii. 645.
—— *conterminum*, iii. 646.
—— cumingianum, iii. 646.
—— *cumingianum*, iii. 646.
—— denticulatum, iii. 646.
—— *dilatatum*, iii. 646.
—— effusum, iii. 646.
—— *equestre*, iii. 644.
—— *exaltatum*, iii. 653.
—— falciculatum, iii. 646.
—— *falciculatum*, iii. 648.
—— filix-mas, iii. 646; iv. 116.
—— ——, var. *paleaceum*, iii. 647.
—— ——, var. *parallelogrammum*, iii. 647.
—— *geropogon*, iii. 649.
—— grisebachii, iii. 647.
—— guatemalense, iii. 647.
—— karwinskyanum, iii. 647.
—— lanceolatum, iii. 647.
—— levyi, iii. 647.
—— lindeni, iii. 648.
—— *lugubre*, iii. 649.
—— macrophyllum, iii. 648.
—— *macrourum*, iii. 649, 650.
Nephrodium martinicense, iii. 648.
—— *mexicanum*, iii. 649.
—— molle, iii. 648.
—— *palatanganum*, iii. 644.
—— pallidum, iii. 648.
—— *paludosum*, iii. 651.
—— *panamense*, iii. 645.
—— *parallelogrammum*, iii. 647.
—— patens, iv. 116.
—— patulum, iii. 649.
—— *patulum*, iii. 651.
—— *propinquum*, iii. 651.
—— puberulum, iii. 649.
—— rigidum, iii. 649.
—— *rudis*, iii. 649.
—— salvinii, iii. 650.
—— sanctum, iii. 650.
—— *schaffneri*, iii. 650.
—— *semicordatum*, iii. 643.
—— *serra*, iii. 650.
—— skinneri, iii. 650.
—— sloanei, iii. 650.
—— *spectabile*, iii. 652.
—— sphærocarpum, iii. 650.
—— *sphærocarpum*, iv. 298.
—— sprengelii, iii. 650.
—— stenophyllum, iii. 650.
—— tetragonum, iii. 650.
—— trianæ, iii. 651.
—— tricholepis, iii. 651.
—— triste, iii. 651.
—— unitum, iii. 651.
—— *unitum*, var. *glabrum*, iii. 651.
—— villosum, iii. 651; iv. 116.
NEPHROLEPIS, iii. 652.
Nephrolepis acuminata, iii. 652.
—— acuta, iii. 652.
—— cordifolia, iii. 652.
—— exaltata, iii. 653.
—— *intermedia*, iii. 652.
—— *neglecta*, iii. 653.
—— *occidentalis*, iii. 652.
—— *pectinata*, iii. 652.
—— *pendula*, iii. 653.
—— *punctulata*, iii. 652.
—— *tuberosa*, iii. 652.
—— *volubilis*, iii. 653.
Nepsera aquatica, i. 417; iv. 243.
NEPTUNIA, i. 344.
Neptunia lutea, i. 344.
—— oleracea, i. 345.
—— plana, i. 345.
—— plena, iv. 32.
—— pubescens, i. 345.
NERIANDRA, ii. 310.
Neriandra aurantiaca, ii. 310.
NERTERA, ii. 54.

Nertera depressa, ii. 54.
—— *depressa*, iv. 234, 248.
Nerteria depressa, ii. 54.
NESÆA, i. 448.
Nesæa, iv. 230.
Nesæa longipes, iv. 37.
—— salicifolia, i. 448.
—— syphilitica, i. 448.
Neumannia imbricata, iii. 316.
—— *petiolata*, iii. 317.
—— *ochroleuca*, iii. 317.
Neurocarpum javitense, i. 295.
Neurodium lanceolatum, iii. 682.
Neurogramme pedata, iii. 677, 678.
—— *rufa*, iii. 678.
NEUROLÆNA, ii. 233.
Neurolæna lobata, ii. 233; iv. 112.
—— macrocephala, ii. 233.
Neuromanes hedwigii, iii. 602.
Neurophyllum hedwigianum, iii. 602.
—— *pinnatum*, iii. 602.
NICANDRA, ii. 425.
Nicandra pysaloides, ii. 425.
NICOLETTIA, ii. 218.
Nicolettia edwardsii, ii. 218; iv. 60.
—— *edwardsii*, iv. 142.
Nicolsonia cayennensis, i. 275.
—— venustula, i. 290.
—— villosa, i. 291.
NICOTIANA, ii. 434.
Nicotiana, iv. 234, 256.
Nicotiana glauca, ii. 434.
—— ipomopsiflora, ii. 434.
—— longiflora, ii. 434.
—— mexicana, ii. 435.
—— nudicaulis, iv. 76.
—— obtusifolia, ii. 435.
—— *parviflora*, ii. 436.
—— pilosa, ii. 435.
—— plantaginea, ii. 435.
—— plumbaginifolia, ii. 435.
—— *plumbaginifolia*, ii. 425.
—— pusilla, ii. 435.
—— repanda, ii. 435.
—— *rubriflora*, ii. 435.
—— *rustica*, ii. 435.
—— sordida, ii. 435.
—— tabacum, ii. 435.
—— trigonophylla, iv. 76.
—— *trigonophylla*, ii. 434.
Nicotidendron, ii. 434.
Nidularium, iii. 313.
—— *karatas*, iii. 313.
NIEREMBERGIA, ii. 437.
Nierembergia angustifolia, ii. 437.
—— *angustifolia*, iv. 291.
—— *anomala*, ii. 436.
Nierembergia coulteri, ii. 437.
—— *filicaulis*, ii. 437.
—— *staticæfolia*, ii. 436.
—— *veitchii*, ii. 437.
—— *viscidula*, ii. 436.
—— viscosa, ii. 437.
NIPHÆA, ii. 472.
Niphæa albo-lineata, ii. 472.
—— oblonga, ii. 472.
—— parviflora, ii. 472.
NISSOLIA, i. 268.
Nissolia fruticosa, i. 268; iv. 28.
—— hirsuta, i. 268.
—— platycalyx, iv. 28.
—— platycarpa, i. 268.
—— *platycarpa*, iv. 28.
—— wislizeni, iv. 28.
Nocca latifolia, ii. 141; iv. 120.
NOLINA, iii. 371.
Nolina, iv. 272, 273, 274, 309.
Nolina hartwegiana, iii. 371.
—— humilis, iii. 372.
—— lindheimeriana, iii. 372.
—— longifolia, iii. 372.
—— parviflora, iii. 372.
—— recurvata, iii. 372.
—— watsoni, iii. 372.
—— *watsoni*, iii. 373.
Nonatelia paniculata, ii. 48.
Nopal sylvestre, i. 551.
NOPALEA, i. 549.
Nopalea, i. 501.
NORANTEA, i. 91.
Norantea anomala, i. 91.
—— *sessiliflora*, i. 91.
Nothaphyllon dugesii, iv. 77.
Nothites ovatifolia, ii. 79.
Nothochlæna, iii. 672.
NOTHOLÆNA, iii. 672.
Notholæna, iii. 674; iv. 140, 281, 282.
Notholæna affinis, iii. 672.
—— æschenborniana, iii. 672.
—— *æschenborniana*, iv. 298.
—— *bipinnata*, iii. 672.
—— brachypus, iii. 673.
—— candida, iii. 673.
—— *candida*, var. *quinquefidopalmata*, iii. 674.
—— cinnamomea, iii. 673.
—— *cretacea*, iii. 673, 674.
—— dealbata, iii. 673.
—— *dealbata*, iii. 675.
—— deltoidea, iii. 673.
—— ferruginea, iii. 673.
—— *galeottii*, iii. 672.
—— grayi, iii. 674.
Notholæna hookeri, iii. 674.
—— *incana*, iii. 674.
—— *lævis*, iii. 675.
—— mollis, iii. 674.
—— nivea, iii. 674.
—— *nivea*, iii. 675.
—— ——, var. *flava*, iii. 674.
—— *pruinosa*, iii. 675.
—— *pulchella*, iii. 673.
—— *pulveracea*, iii. 672, 673.
—— *rufa*, iii. 674.
—— sinuata, iii. 675.
—— *sinuata*, var. *integra*, iii. 675.
—— ——, var. *pinnis integris*, iii. 675.
—— ——, var. *pruinosa*, iii. 675.
—— *squamosa*, iii. 673.
—— *sulphurea*, iii. 673.
—— *trichomanoides*, iii. 674.
NOTHOSCORDUM, iii. 377.
Nothoscordum, iv. 229, 274.
—— *fragrans*, iii. 377.
—— striatum, iii. 378.
Notolæna, iv. 149.
NOTYLIA, iii. 293.
Notylia albida, iii. 293.
—— barkeri, iii. 293.
—— bicolor, iii. 293.
—— bipartita, iii. 293.
—— huegelii, iii. 293.
—— multiflora, iii. 293.
—— orbicularis, iii. 293.
—— pentachne, iii. 293.
—— *tridachne*, iii. 293.
—— trisepala, iii. 293.
Nowodworskya agrostoides, iii. 553.
NYCTAGINEÆ, iii. 1; iv. 82, 107.
Nyctagineæ, iv. 190, 203, 215, 217, 225, 229, 233, 258.
NYCTAGINIA, iii. 3.
Nyctaginia capitata, iii. 3.
—— *ovata*, iii. 3.
—— *torreyana*, iii. 2.
Nycterium amazonium, ii. 404.
NYMPHÆA, i. 25.
Nymphæa ampla, i. 25; iv. 4.
—— blanda, i. 25.
—— *candolleana*, i. 25.
—— elegans, i. 25.
—— *fenzliana*, i. 25.
—— gracilis, i. 25.
—— jamesoniana, i. 26.
—— *leiboldiana*, i. 25.
—— mexicana, i. 26.
—— *rudgeana*, i. 25.
—— *sagittariæfolia*, i. 26.
—— tussilagifolia, i. 26.

Nymphæa undulata, i. 26.
NYMPHÆACEÆ, i. 24; iv. 4.
Nymphæaceæ, iv. 172, 204, 214, 216.
NYMPHÆÆ, i. 25.
Nunnezharia, iii. 402.
—— *geonomæformis,* iii. 404.
—— *tenella,* iii. 407.
Nunnezia, iii. 402.

Obeliscaria columnaris, ii. 167.
Obione acanthocarpa, iii. 24, 25.
—— *arenaria,* iii. 24.
—— *berlandieri,* iii. 24.
—— *canescens,* iii. 24, 25; iv. 141.
—— *confertifolia,* iii. 25.
—— *elegans,* iii. 24.
—— *hymenelytra,* iii. 25.
—— *kunthiana,* iii. 25.
—— *linifolia,* iii. 25.
—— *muricata,* iii. 25.
—— *occidentalis,* iii. 24.
—— *polygama,* iii. 25.
—— *radiata,* iii. 24.
—— *salicifolia,* iii. 25.
—— *spinosa,* iii. 25.
—— *tetraptera,* iii. 24.
Ocampoa, iii. 297.
OCHNACEÆ, i. 176.
Ochnaceæ, iv. 176, 205, 216.
OCHNEÆ, i. 176.
OCHROMA, i. 125.
Ochroma, iv. 237.
Ochroma lagopus, i. 125.
OCIMUM ii. 541.
Ocimum campechianum, ii. 541.
—— carnosum, ii. 541.
—— micranthum, ii. 541.
—— sellowii, ii. 541.
OCOTEA, iii. 72.
Ocotea, iv. 231.
Ocotea bullata, iii. 74.
—— diminuta, iii. 73.
—— effusa, iii. 73.
—— helicterifolia, iii. 73.
—— klotzschiana, iii. 73.
—— longipes, iii. 73.
—— mexicana, iii. 73.
—— *mollis,* iii. 74, 75.
—— mucosa, iii. 73.
—— pyschotrioides, iii. 73.
—— *salicifolia,* iii. 74, 75.
—— sieberi, iii. 73.
—— subsessilis, iii. 73.
—— subtriplinervia, iii. 74.
—— tampicensis, iii. 74.
—— umbrosa, iii. 74.
OCTOMERIA, iii. 209.
OCTOPLEURA, i. 432.
Octopleura diversifolia, i. 432.
—— micrantha, i. 432; iv. 36.
—— *micrantha,* iv. 242.
—— quinquenervia, i. 433.
ODONTADENIA, ii. 313.
Odontadenia grandiflora, ii. 314.
—— *harrisii,* ii. 314.
—— speciosa, ii. 314.
ODONTOCARYA, i. 20.
Odontocarya hederæfolia, i. 21.
—— tamoides, i. 21.
ODONTOGLOSSUM, iii. 273.
Odontoglossum, iii. 278; iv. 124, 213, 269, 271.
Odontoglossum apterum, iii. 274.
—— *aspasia,* iii. 273.
—— beloglossum, iii. 274.
—— bictoniense, iii. 274.
—— cærulescens, iii. 274; iv. 304.
—— cariniferum, iii. 274.
—— *cariniferum,* iv. 295.
—— cervantesii, iii. 274.
—— chiriquense, iii. 274.
—— *chiriquense,* iv. 295.
—— citrosmum, iii. 274.
—— cordatum, iii. 275.
—— dawsonianum, iii. 275.
—— egertoni, iii. 275.
—— ehrenbergii, iii. 275.
—— *ehrenbergii,* iii. 274.
—— *erosum,* iii. 277.
—— galeottianum, iii. 275.
—— *galeottianum,* iv. 295, 304.
—— ghiesbreghtianum, iii. 275.
—— grande, iii. 275.
—— *hastatum,* iii. 282; iv. 302.
—— *hastilabium,* var. *fuscatum,* iii. 274.
—— *hookeri,* iii. 275.
—— insleayi, iii. 275.
—— karwinskii, iii. 275.
—— krameri, iii. 276.
—— læve, iii. 276.
—— leucomelas, iii. 276.
—— *lindleyi,* iii. 283; iv. 302.
—— londesboroughianum, iii. 276.
—— *lüddemanni,* iii. 275.
—— macrum, iii. 276.
—— *maculatum,* iii. 276; iv. 302.
—— madrense, iii. 276.
—— *madrense,* iv. 269.
—— maxillare, iii. 276.
—— *membranaceum,* iii. 274; iv. 304, 305.
—— nebulosum, iii. 276.
Odontoglossum nebulosum, iv. 305.
—— œrstedii, iii. 276.
—— *œrstedii,* iv. 158, 295.
—— oliganthum, iii. 277.
—— *pendulum,* iii. 274.
—— *phyllochilum,* iii. 282.
—— *principissa,* iii. 273.
—— pulchellum, iii. 277.
—— pygmæum, iii. 277.
—— *ramulosum,* iii. 278.
—— reichenheimii, iii. 277.
—— *rossii,* iii. 274.
—— rubescens, iii. 277.
—— schlieperianum, iii. 277.
—— stellatum, iii. 277.
—— *tigrinum,* iii. 286.
—— uroskinneri, iii. 277.
—— vexativum, iii. 277.
—— *warneri,* iii. 287.
—— ——, var. *purpuratum,* iii. 287.
—— warnerianum, iii. 278.
—— warscewiczianum, iii. 277.
Odontoloma schlechtendalii, iii. 605.
Odontotrichum cirsiifolium, ii. 237.
Œdipachne, iii. 483.
ŒNANTHE, i. 569.
Œnanthe, iv. 150.
ŒNOTHERA, i. 452.
Œnothera, iv. 140, 148, 213, 234, 243.
Œnothera albicaulis, i. 452.
—— *anomala,* i. 467.
—— berlandieri, i. 453.
—— *berlandieri,* iv. 37.
—— biennis, i. 453.
—— brachycarpa, i. 453; iv. 37.
—— chamænerioides, i. 453.
—— *corymbosa,* i. 454.
—— cuprea, i. 453.
—— dentata, i. 453.
—— dissecta, iv. 37.
—— elata, i. 453.
—— *fendleri,* i. 453.
—— gauræflora, i. 453.
—— greggii, i. 453.
—— hartwegii, i. 453; iv. 37.
—— hirsuta, i. 453.
—— *hirsuta,* iv. 37.
—— hirsutissima, i. 453.
—— latiflora, i. 453.
—— littoralis, i. 454.
—— macrosceles, i. 454; iv. 37.
—— mexicana, i. 454.
—— micrantha, i. 454.
—— *micrantha,* i. 453.
—— *pallida,* i. 452.
—— pinnatifida, i. 454.
—— rosea, i. 454.

Œnothera rosea, iv. 285.
—— simsiana, i. 454.
—— sinuata, i. 454.
—— speciosa, i. 454; iv. 37.
—— *spectabilis*, i. 454.
—— tetraptera, i. 454.
—— *tetraptera*, i. 453.
—— triloba, i. 455.
—— tubifera, i. 455.
Œrstedella centradenia, iii. 227.
—— *centropetala*, iii. 227.
Ogiera triplinervis, ii. 171.
Ohigginsia, ii. 35.
OKENIA, iii. 7.
Okenia hypogæa, iii. 7.
OLACEÆ, i. 185.
OLACINEÆ, i. 184.
Olacineæ, iv. 176, 204, 229.
OLDENLANDIA, ii. 29.
Oldenlandia angustifolia, ii. 29.
—— *corymbosa*, ii. 29.
—— deppeana, ii. 29.
—— halei, ii. 29.
—— herbacea, ii. 29.
—— latifolia, ii. 29.
—— microtheca, ii. 29.
—— ovata, iv. 47.
—— umbellata, ii. 29.
OLEACEÆ, ii. 303; iv. 67.
Oleaceæ, iv. 186, 204, 225, 231.
OLEANDRA, iii. 653.
Oleandra articulata, *β. welwitschii*, iii. 653.
—— neriiformis, iv. 116.
—— nodosa, iii. 653; iv. 116.
Olfersia cervina, iii. 684.
—— *speciosa*, iii. 689.
OLIGANTHES, ii. 75.
Oliganthes discolor, ii. 75.
—— karwinskii, ii. 75.
—— oxylepis, ii. 76.
Oligogyne tampicana, ii. 169.
OLIGOMERIS, i. 46.
Oligomeris glaucescens, i. 46.
—— subulata, i. 46.
Oligosporus mexicanus, iv. 63.
OLIVÆA, ii. 209.
Olivæa tricuspis, ii. 209.
OLMEDIA, iii. 148.
Olmedia aspera, iii. 148.
OLNEYA, i. 260.
Olneya tesota, i. 260.
OLYRA, iii. 510.
Olyra, iii. 232, 280.
Olyra latifolia, iii. 510.
—— *latifolia*, iv. 280.
—— *paniculata*, iii. 510.
Olyra pauciflora, iii. 510.
—— semiovata, iii. 510.
—— strictiflora, iii. 510.
Omphalea, iii. 133; iv. 231.
Omphalea cardiophylla, iii. 134.
—— diandra, iii. 134.
—— oleifera, iii. 134.
—— panamensis, iii. 134.
OMPHALODES, ii. 377.
Omphalodes, iv. 256.
Omphalodes aliena, ii. 377.
—— cardiophylla, ii. 377; iv. 72.
ONAGRARIEÆ, i. 449; iv. 37.
Onagrarieæ, iv. 180, 202, 215, 217, 225, 234, 243.
ONCIDIUM, iii. 278.
Oncidium, iv. 148, 152, 153, 213, 269, 271, 300, 304.
—— *albo-violaceum*, iii. 282.
—— altissimum, iii. 278.
—— amœnum, iii. 278.
—— ampliatum, iii. 278.
—— *ampliatum*, iv. 270.
—— ansiferum, iii. 279.
—— *ansiferum*, iv. 295.
—— ascendens, iii. 279.
—— barbatum, iii. 279.
—— *barkeri*, iii. 286.
—— batemanianum, iii. 279.
—— bicallosum, iii. 279.
—— *brachiatum*, iii. 287.
—— brachyandrum, iii. 279.
—— *brachyphyllum*, iii. 280.
—— bracteatum, iii. 279.
—— *bracteatum*, iv. 295.
—— brassia, iii. 288.
—— brevifolium, iii. 279.
—— bryolophotum, iii. 280.
—— *candidum*, iii. 287.
—— cardiochilum, iii. 280.
—— cardiostigma, iii. 280.
—— *carinatum*, iii. 289.
—— carthaginense, iii. 280.
—— *caudatum*, iii. 288.
—— cavendishianum, iii. 280.
—— *cavendishianum*, iii. 284.
—— cebolleta, iii. 280.
—— *cebolleta*, iv. 2 0.
—— *cepula*, iii. 280.
—— cerebriferum ii. 280.
—— cheirophorum, iii. 281.
—— *cheirophorum*, iv. 295.
—— *ciliatulum*, iii. 279.
—— *ciliatum*, iii. 279.
—— concolor, iii. 281.
—— *confragosum*, iii. 286.
—— confusum, iii. 281.
Oncidium cosymbephorum, iii. 283.
—— crista-galli, iii. 281.
—— *cuneatum*, iii. 283.
—— *decipiens*, iii. 281.
—— delumbe, iii. 281.
—— diaphanum, iii. 281.
—— *digitatum*, iii. 283.
—— *echinatum*, iii. 289.
—— ensatum, iii. 281.
—— excavatum, iii. 281; iv. 89.
—— *filipes*, iii. 282.
—— *fimbriatum*, iii. 279.
—— forkelii, iii. 281.
—— funereum, iii. 281.
—— *funereum*, iii. 285.
—— *galeottianum*, iv. 303.
—— *gallopavinum*, iii. 279.
—— *geertianum*, iii. 284.
—— ghiesbreghtianum, iii. 282.
—— *gireoudianum*, iii. 288.
—— glossomystax, iii. 282.
—— graminifolium, iii. 282.
—— *graminifolium*, iv. 295, 304, 305.
—— *guttatum*, iii. 283.
—— hastatum, iii. 282.
—— *helenæ*, iii. 287.
—— *henchmanni*, iii. 280.
—— herbaceum, iii. 283.
—— *huntianum*, iii. 280.
—— *hyalinobulbum*, iv. 89.
—— incurvum, iii. 282; iv. 302.
—— *insleayi*, iii. 275.
—— *intermedium*, iii. 283.
—— *ionosmum*, iii. 286.
—— *iridifolium*, iii. 281, 282.
—— *juncifolium*, iii. 280.
—— *karwinskii*, iii. 276.
—— *klotzschianum*, iii. 284.
—— *lacerum*, iii. 286.
—— *lawrenceanum*, iii. 288.
—— leucochilum, iii. 282.
—— *lindeni*, iii. 283.
—— lindleyi, iii. 283.
—— *longifolium*, iii. 280.
—— luridum, iii. 283.
—— *luridum*, var. *atratum*, iii. 283.
—— ——, var. *guttatum*, iii. 283.
—— —— *henchmanni*, iii. 280.
—— *macrantherum*, iii. 289.
—— macranthum, iii. 283.
—— *macropterum*, iii. 286; iv. 304.
—— maculatum, iii. 283.
—— *maculatum*, var. *aristatum*, iii. 283.
—— —— *donianum*, iii. 283.
—— microchilum, iii. 283.
—— *microglossum*, iii. 279.

Oncidium mirabile, iii. 291.
—— nebulosum, iii. 284.
—— oblongatum, iii. 284.
—— obovatum, iii. 284.
—— ochmatochilum, iii. 284.
—— *ochmatochilum*, iv. 295.
—— *œrstedii*, iii. 280.
—— onustum, iii. 284.
—— ornithorhynchum, iii. 284.
—— *ornithorhynchum*, iv. 302.
—— pachyphyllum, iii. 284.
—— *pachyphyllum*, iii. 280.
—— *panduriferum*, iii. 280.
—— parviflorum, iii. 283.
—— *pauciflorum*, iii. 286.
—— *pelicanum*, iii. 285.
—— peliogramma, iii. 284.
—— pergameneum, iii. 284.
—— phymatochilum, iii. 285.
—— *pinellianum*, iii. 279.
—— polycladium, iii. 285.
—— psittacinum, iii. 283.
—— *pusillum*, iii. 282; iv. 270.
—— *ramosum*, iii. 279.
—— rariflorum, iii. 285.
—— *rariflorum*, iv. 304.
—— reflexum, iii. 285.
—— retemeyerianum, iii. 285.
—— *roseum*, iii. 280.
—— rupestre, iii. 285.
—— russellianum, iii. 283.
—— *sanguineum*, iii. 280.
—— ——, var. *auriculatum*, iii. 283.
—— *skinneri*, iii. 285.
—— sphacelatum, iii. 285.
—— *sphacelatum*, iv. 269, 301.
—— *spilopterum*, iii. 279.
—— splendidum, iii. 285.
—— stelligerum, iii. 285.
—— *stenopetalum*, iii. 279.
—— stenotis, iii. 285.
—— stipitatum, iii. 286.
—— stramineum, iii. 286.
—— *stramineum*, iv. 301.
—— suave, iii. 286.
—— *suave*, iv. 295.
—— *suaveolens*, iii. 288.
—— suttoni, iii. 286.
—— *suttoni*, iv. 303.
—— tenue, iii. 286.
—— *tenue grandiflorum*, iii. 281.
—— tetrapetalum, iii. 286.
—— tigrinum, iii. 286.
—— *tigrinum*, var. *splendidum*, iii. 285.
—— tricolor, iii. 286.
—— tricuspidatum, iii. 286.
Oncidium unguiculatum, iii. 286.
—— *verrucosum*, iii. 288.
—— vinosum, iii. 283.
—— *viperinum*, iii. 286.
—— warneri, iii. 287.
—— warscewiczii, iii. 287.
—— *wendlandianum*, iii. 286.
—— wentworthianum, iii. 287.
—— *wrayæ*, iii. 282.
—— *xanthochlorum*, iii. 284.
ONCOBEÆ, i. 56.
Oncostylis, iii. 462.
—— *arenaria*, iii. 459.
—— *ciliata*, iii. 459.
—— *dubia*, iii. 459.
—— *hispida*, iii. 460.
—— *nigricans*, iv. 157.
—— schaffneri, iv. 93.
—— *tenuifolia*, iii. 459.
—— *truncata*, iii. 459.
Onoseris, ii. 253.
Onoseris isotypus, ii. 254.
Onosma strigosa, ii. 380.
—— *trinervia*, ii. 380.
Onosmodium, ii. 380.
Onosmodium strigosum, ii. 380.
Onosmodium strigosum, iv. 291.
Onychacanthus, ii. 509.
—— *berlandierianus*, ii. 509.
—— *cumingii*, ii. 509.
—— *speciosus*, ii. 509.
Onychium angustifolium, iii. 618.
Operculina tuberosa, ii. 395.
OPHIOGLOSSACEÆ, iii. 697.
Ophioglossum, iii. 697.
Ophioglossum, iv. 304.
—— *bulbosum*, iii. 698.
—— *crotalophoroides*, iii. 698.
—— palmatum, iii. 697.
—— reticulatum, iii. 697.
—— *vulgatum*, iii. 698.
Ophiorhiza mitreola, ii. 340.
OPHRYDEÆ, iii. 304.
Ophrydeæ, iv. 195.
Ophryococcus, ii. 32.
Ophryococcus gesnerioides, ii. 32.
Ophryoscleria asperrima, iii. 469.
—— *lucida*, iii. 470.
—— *mitis*, iii. 470.
Ophryosporus, ii. 79.
Ophryosporus ovatifolius, ii. 79.
Ophrys ciliata, iii. 297.
—— *macrostachya*, iii. 210; iv. 89.
Ophthalmacanthus bourgæi, ii. 504.
—— *gemmiparus*, ii. 504.
—— *parvus*, ii. 506.
—— *roseus*, ii. 507.
Ophthalmacanthus speciosus, ii. 507.
Opizia, iii. 567.
Opizia, iv. 279.
Opizia stolonifera, iii. 567.
—— *stolonifera*, iv. 297.
Oplismenus, iii. 500.
Oplismenus, iii. 503.
Oplismenus angustifolius, iii. 501.
—— *burmanni*, iii. 501.
—— chondrosioides, iii. 501.
—— colonus, iii. 501.
—— *colonus*, iii. 494.
—— *cristatus*, iii. 501.
—— crus-galli, iii. 501.
—— *crus-pavonis*, iii. 501.
—— depauperatus, iii. 501.
—— holciformis, iii. 501.
—— *holciformis*, iii. 503.
—— humboldtianus, iii. 501.
—— liebmanni, iii. 502.
—— loliaceus, iii. 502.
—— polystachyus, iii. 502.
—— rariflorus, iii. 502.
—— *repens*, iii. 494.
—— setarius, iii. 502.
—— spectabilis, iii. 502.
—— sylvaticus, iv. 114.
—— *tenuis*, iii. 503.
—— thiebauti, iii. 502.
—— zelayensis, iii. 502.
Oplotheca gracilis, iii. 19.
—— *interrupta*, iii. 19.
Opuntia, i. 549.
Opuntia, i. 501; iv. 140, 141, 144, 213, 233, 246, 247.
Opuntia albicans, i. 549.
—— amyclæa, i. 549.
—— angusta, i. 549.
—— angustior, i. 550.
—— arborescens, i. 549.
—— arbuscula, i. 549.
—— arenaria, i. 549.
—— basilaris, i. 550.
—— brevispina, i. 551.
—— brunnea, i. 553.
—— bulbispina, i. 550.
—— candelabriformis, i. 550.
—— clavarioides, i. 550.
—— *coccinellifera*, i. 549, 554.
—— crassa, i. 550.
—— *cristata*, i. 551.
—— *darwinii*, iv. 247.
—— decipiens, i. 550.
—— decumbens, i. 550.
—— echinocarpa, i. 550.
—— emoryi, i. 550.
—— engelmannii, i. 550.

Opuntia exuviata, i. 550.
—— *exuviata*, i. 551.
—— —— *stellata*, i. 549.
—— ferox, i. 551.
—— ficus-indica, i. 551; iv. 246.
—— filipendula, i. 551.
—— *flavicans*, i. 553.
—— frutescens, i. 551.
—— fulgida, i. 551.
—— *furiosa*, i. 554.
—— glaucescens, i. 551.
—— glaucophylla, i. 551.
—— gracilis, i. 551.
—— grahami, i. 551.
—— grandis, i. 551.
—— hernandezii, i. 551.
—— imbricata, i. 551; iv. 45.
—— *irrorata*, i. 550.
—— karwinskiana, i. 552.
—— kleiniæ, i. 552; iv. 45.
—— leptocaulis, i. 552.
—— leucacantha, i. 552.
—— leucosticta, i. 552.
—— leucotricha, i. 552.
—— longispina, i. 551.
—— macrocentra, i. 552.
—— major, i. 550.
—— mamillata, i. 552.
—— megacantha, i. 552.
—— microdasys, i. 552.
—— minor, i. 552.
—— nigricans, i. 552.
—— oblongata, i. 552.
—— *oligacantha*, i. 553.
—— *parvula*, i. 550.
—— phæacantha, i. 553.
—— pottsii, i. 553.
—— *prate*, i. 549.
—— pseudo-tuna, i. 553.
—— puberula, i. 553.
—— pubescens, i. 553.
—— *pulvinata*, i. 552.
—— *ramosissima*, i. 554.
—— ramulifera, i. 553.
—— *repens*, i. 550.
—— robusta, i. 553.
—— rosea, i. 553.
—— rufida, i. 553.
—— schottii, i. 553.
—— setispina, i. 553.
—— spinosior, i. 550, 554.
—— spinulifera, i. 553.
—— stapeliæ, i. 553.
—— *stellata*, i. 549.
—— stenopetala, i. 553.
—— streptacantha, i. 553.
—— tenuispina, i. 554.
Opuntia tessellata, i. 554.
—— thurberi, i. 554.
—— tomentosa, i. 554.
—— tuna, i. 554.
—— tunicata, i. 554.
—— vaginata, i. 554.
—— vulgaris, i. 554.
—— *vulgaris*, i. 551.
—— whipplei, i. 554.
—— wrightii, i. 554.
OPUNTIEÆ, i. 548.
ORCHIDEÆ, iii. 197; iv. 89.
Orchideæ, iv. 195, 202, 215, 217, 226, 229, 233, 267.
Orchidofunkia pallidiflora, iii. 290.
Orchis entomantha, iii. 305.
—— *habenaria*, iii. 305.
Ordines anomali, iii. 179.
Oreinotinus acutifolius, ii. 2.
—— *costaricanus*, ii. 2; iv. 157.
—— *fuscus*, ii. 2.
—— *membranaceus*, ii. 2.
—— *microcarpus*, ii. 2.
—— *microphyllus*, ii. 3.
—— *rhombifolius*, ii. 3.
—— *stellato-tomentosus*, ii. 3; iv. 159.
—— *stellatus*, ii. 3.
—— *stenocalyx*, ii. 3.
—— *sulcatus*, ii. 3.
—— *tiliæfolius*, ii. 3.
—— *wendlandi*, ii. 3.
Oreodaphne benthamiana, iii. 72.
—— *effusa*, iii. 73.
—— *helicterifolia*, iii. 73.
—— *klotzschiana*, iii. 73.
—— *mexicana*, iii. 73.
—— *mucosa*, iii. 73.
—— *psychotrioides*, iii. 73.
—— *sieberi*, iii. 73.
—— *subtriplinervia*, iii. 74.
—— *tampicensis*, iii. 74.
—— *umbrosa*, iii. 74.
Oreocosmus galeottianus, i. 418, 419.
—— *ghiesbreghtii*, i. 419.
OREODOXA, iii. 401.
Oreodoxa, iv. 146, 276.
—— *frigida*, iv. 276.
—— *oleracea*, iv. 152, 276.
—— regia, iii. 401.
—— *regia*, iv. 276, 277.
Oreomunnea pterocarpa, iii. 164.
OREOMYRRHIS, i. 567.
Oreomyrrhis, iv. 234.
—— *andicola*, iv. 234.
—— andina, i. 567.
—— gracilipes, i. 567.
—— *gracilipes*, i. 568; iv. 248.
Oreomyrrhis planipetala, i. 568.
—— *planipetala*, iv. 248.
OREOPANAX, i. 573.
Oreopanax capitatum, i. 573.
—— *coriaceum*, i. 574.
—— costaricense, i. 573.
—— *costaricense*, iv. 286.
—— destructor, i. 573.
—— echinops, i. 573.
—— flaccidum, i. 573.
—— geminatum, i. 573.
—— guatemalense, i. 573.
—— jatrophæfolium, i. 573.
—— liebmannii, i. 573.
—— œrstedianum, i. 573.
—— *œrstedianum*, iv. 159, 286.
—— platyphyllum, i. 573.
—— ruizii, i. 574.
—— salvinii, i. 574.
—— thibautii, i. 574.
—— xalapense, i. 574; iv. 46.
Origanum majorana, ii. 551.
—— *vulgare*, ii. 548.
ORMOCARPUM, i. 270.
Ormocarpum coccineum, i. 270.
—— elegans, i. 270.
—— thurberi, i. 270.
ORMOSIA, i. 321.
Ormosia coccinea, i. 321.
—— panamensis, i. 321.
ORNITHIDIUM, iii. 269.
Ornithidium album, iii. 265.
—— anceps, iii. 269.
—— densum, iii. 269.
—— fulgens, iii. 270.
—— histrionicum, iii. 270.
—— paleatum, iii. 270.
—— strumatum, iii. 270.
ORNITHOCEPHALUS, iii. 291.
Ornithocephalus bicornis, iii. 291.
—— elephas, iii. 291.
—— inflexus, iii. 291.
—— iridifolius, iii. 291.
—— *mexicanus*, iii. 291.
—— salvinii, iii. 291.
Ornithogalum bivalve, iii. 378.
OROBANCHACEÆ, ii. 467; iv. 77.
Orobanchaceæ, iv. 188, 204, 217, 225, 229.
Orobanche americana, ii. 468.
—— *fasciculata*, ii. 468.
—— *ludoviciana*, ii. 468.
—— *multiflora*, ii. 468.
Ortachne pilosa, iii. 534.
—— *scabra*, iii. 534.
—— *tenuis*, iii. 535.
ORTHOCARPUS, ii. 463.

Orthocarpus australis, ii. 463.
—— mexicanus, ii. 463; iv. 77.
ORTHOCLADA, iii. 576.
Orthoclada, iv. 280.
—— *laxa*, iii. 576.
—— rariflora, iii. 576.
Ortholoma acuminatum, ii. 485.
—— *ochroleucum*, ii. 486.
—— *pendulum*, ii. 486.
—— *vestitum*, ii. 487.
—— *warscewiczianum*, ii. 487.
Orthopogon, iii. 500.
—— *setarius*, iii. 502.
Orthosia kunthii, ii. 328.
Orthosiphon capitatus, ii. 541.
ORTHROSANTHUS, iii. 329.
Orthrosanthus, iv. 234.
Orthrosanthus chimboracensis, iii. 329.
ORYZA, iii. 513.
Oryza hexandra, iii. 514.
—— *mexicana*, iii. 514.
—— *monandra*, iii. 514.
—— *sativa*, iii. 513.
ORYZEÆ, iii. 513.
ORYZOPSIS, iii. 538.
Oryzopsis fimbriata, iii. 538.
—— fournieriana, iii. 538.
Osbeckia, iv. 242.
OSBECKIEÆ, i. 416.
OSERYA, iii. 39.
Oserya coulteriana, iii. 40.
OSMORRHIZA, i. 567.
Osmorrhiza, iv. 229.
—— brevistylis, i. 567.
—— *brevistylis*, iv. 286.
—— *claytoni*, i. 567.
—— *longistylis*, i. 567.
OSMUNDA, iii. 691.
Osmunda cinnamomea, iii. 691.
—— *imbricata*, iii. 691.
—— *mexicana*, iii. 692.
—— *palustris*, iii. 692.
—— regalis, iii. 691.
—— *regalis*, var. *spectabilis*, *β. brasiliensis*, iii. 692.
—— spectabilis, *β*. palustris, iii. 692.
—— *spectabilis*, iii. 691.
OSMUNDACEÆ, iii. 691.
Osmundia regalis, iv. 144.
Ossæa, iv. 36, 243.
Osteomeles, i. 379; iv. 233.
OSTRYA, iii. 166.
Ostrya, iv. 260, 263, 309, 312.
Ostrya virginica, iii. 166.
Ostrya virginica, iv. 309.
—— *vulgaris*, iii. 166.
Ostryopsis, iv. 260, 261.
Otaria fragrans, ii. 323.
—— *laxiflora*, ii. 324.
Oteiza acuminata, ii. 205.
Othlis, i. 12.
OTOPAPPUS, ii. 191.
Otopappus curviflorus, ii. 191.
—— epaleaceus, ii. 191.
—— robustus, ii. 191.
—— verbesinoides, ii. 192.
OTTOA, i. 568.
Ottoa œnanthoides, i. 568.
—— *œnanthoides*, iv. 248, 286.
Ottonia glaucescens, iii. 48.
—— *stipulacea*, iii. 55.
Ourouparia, ii. 6.
OXALIDEÆ, i. 162.
OXALIS, i. 162.
Oxalis, iv. 147, 213.
Oxalis acuminata, i. 162.
—— *acuminata*, i. 164.
—— albicans, i. 162.
—— *albicans*, iv. 283.
—— angustifolia, i. 162.
—— *bipunctata*, i. 164.
—— corniculata, i. 163.
—— decaphylla, i. 163.
—— dendroides, i. 163.
—— *deppei*, i. 165.
—— dichondræfolia, i. 163.
—— discolor, i. 163.
—— divergens, i. 163.
—— *divergens*, iv. 283.
—— drummondii, i. 163.
—— ehrenbergii, i. 163.
—— fasciculata, i. 163.
—— *floribunda*, i. 164.
—— galeottii, i. 163.
—— glabrata, i. 164.
—— grahamiana, i. 163.
—— hedysaroides, i. 164.
—— hernandezii, i. 164.
—— *hernandezii*, i. 163.
—— herpestica, i. 164.
—— jacquiniana, i. 164.
—— lasiandra, i. 164.
—— latifolia, i. 164.
—— *latifolia*, iv. 149.
—— lilacina, i. 164.
—— lindeni, i. 164.
—— lunulata, i. 164.
—— martiana, i. 164.
—— microphylla, i. 164.
—— neæi, i. 164.
—— nudiflora, i. 165.
—— pentantha, i. 165.
—— psilotricha, i. 165.
Oxalis rubrocincta, i. 165.
—— sepium, i. 165.
—— tephrodes, i. 165.
—— tetraphylla, i. 165.
—— verticillata, i. 165.
—— vespertilionis, i. 165.
—— wrightii, i. 165; iv. 17.
OXYBAPHUS, iii. 2.
Oxybaphus, iv. 229, 258.
Oxybaphus aggregatus, iii. 2.
—— angustifolius, iii. 2.
—— cervantesii, iii. 3; iv. 82.
—— *coccineus*, iii. 1.
—— cordifolius, iii. 3.
—— glabrifolius, iii. 3.
—— *multiflorus*, iii. 2.
—— ovatus, iii. 3.
—— violaceus, iii. 3.
—— viscosus, iii. 3.
—— *viscosus*, iv. 82.
—— wrightii, iii. 3.
Oxylepis lanata, ii. 227.
OXYMERIS, i. 422.
Oxymeris, iv. 243.
Oxymeris cinnamomea, i. 422.
—— cornioides, i. 422.
—— heterobasis, i. 423.
—— melanodesma, i. 423.
—— multiplinervis, i. 423.
—— secunda, i. 423.
—— subseriata, i. 423.
OXYPAPPUS, ii. 210.
Oxypappus scaber, ii. 210.
OXYPETALUM, ii. 321.
Oxypetalum, iv. 254.
Oxypetalum riparium, ii. 321.
OXYTROPIS, i. 267.
Oxytropis lamberti, i. 267.
OYEDÆA, ii. 175.
Oyedæa acuminata, ii. 176.
—— *acuminata*, iv. 288.
—— ampeloides, ii. 176.
—— macrophylla, ii. 176.
—— ovalifolia, ii. 176.
—— *seemannii*, iv. 56.

PACHIRA, i. 123.
Pachira, iv. 146.
Pachira aquatica, i. 124; iv. 111.
—— barrigon, i. 124.
—— *fendleri*, i. 124.
—— insignis, i. 124.
—— macrocarpa, i. 124.
—— minor, i. 124.
—— sessilis, i. 124.
PACHYGONEÆ, i. 22.
Pachyneurium salviniæ, iii. 433.

PACHYPHYLLUM, iv. 89.
Pachyphyllum distichum, iv. 89.
—— *procumbens*, iii. 269.
—— *scandens*, iv. 89.
—— *uniflorum*, iv. 89.
Pachyphytum bracteosum, i. 391.
Pachypodium, i. 31.
PACHYRHIZUS, i. 309.
Pachyrhizus angulatus, i. 309; iv. 31.
—— palmatilobus, i. 310.
Pachystachys nutans, ii. 521.
Pachythelia mexicana, ii. 134.
PÆDERIEÆ, ii. 54.
PÆPALANTHUS, iii. 442.
PALAFOXIA, ii. 214.
Palafoxia, iv. 59.
—— *hookeriana*, iv. 141.
—— latifolia, ii. 214; iv. 59.
—— *leucophylla*, iv. 59.
—— lindeni, ii. 214; iv. 59.
—— linearis, ii. 214; iv. 59.
—— texana, ii. 214; iv. 59.
Palamostigma, iii. 117.
—— *xalapense*, iii. 117.
Paleolaria carnea, ii. 214.
PALICOUREA, ii. 51.
Palicourea costaricensis, ii. 51.
—— *costaricensis*, iv. 157.
—— galeottiana, ii. 51.
—— gardenioides, ii. 52.
—— intermedia, ii. 52.
—— lanceolata, ii. 52.
—— lasiorrhachis, ii. 52.
—— mexicana, ii. 52.
—— *mexicana*, iv. 157.
—— nigrescens, ii. 52.
—— parviflora, ii. 52.
—— subrubra, ii. 52.
Paliurus, i. 197.
—— *texanus*, iv. 22.
Palma argentea, iii. 412.
PALMÆ, iii. 400; iv. 91, 109, 198, 202, 215, 217, 231, 274.
Paltonium lanceolatum, iii. 682.
PALUMBINA, iii. 287.
Palumbina candida, iii. 287.
Panax morototoni, i. 572.
—— *speciosum*, i. 572; iv. 162.
Pancratium disciforme, iii. 336.
—— *glaucum*, iii. 335.
—— *mexicanum*, iii. 335, 336.
—— *rotatum*, iii. 335.
Pandaneæ, iv. 198.
Pandanus utilis, iii. 415.
PANICACEÆ, iii. 475.
Panicaceæ, iii. 531; iv. 199.
PANICEÆ, iii. 476.
PANICUM, iii. 485.
Panicum, iii. 499, 501; iv. 148, 213.
Panicum acuminatum, iii. 485.
—— *acuminatum*, iii. 493.
—— *adscendens*, iii. 491.
—— *alsinoides*, iii. 500.
—— *altissimum*, iii. 491.
—— ambitiosum, iii. 485.
—— *appressum*, iii. 493.
—— *arenarium*, iii. 490, 495.
—— *arundinaceum*, iii. 484.
—— arundinariæ, iii. 485.
—— ascendens, iii. 485; iv. 94.
—— aturense, iii. 485.
—— *auritum*, iii. 486.
—— avenaceum, iii. 486.
—— *barbinode*, iii. 492.
—— *berchtoldia*, iii. 503.
—— *blepharophorum*, iii. 485.
—— *bonplandianum*, iii. 502.
—— bourgæi, iii. 486.
—— brevifolium, iii. 486.
—— *brizoides*, iii. 493.
—— buchingeri, iii. 486.
—— bulbosum, iii. 486.
—— cæspitosum, iii. 486.
—— *capillare*, var. *sylvaticum*, iii. 497.
—— carthaginense, iii. 487.
—— *carthaginense*, iii. 489.
—— *caudatum*, iii. 503.
—— chauvinii, iii. 487.
—— chloroticum, iii. 487.
—— clandestinum, iii. 487.
—— *colonum*, iii. 501.
—— *coloratum*, iii. 490.
—— commelinæfolium, iii. 487.
—— compactum, iii. 487.
—— *compositum*, iii. 504.
—— conchatum, iii. 487.
—— cordovense, iii. 487.
—— *cristatum*, iii. 501.
—— *crus-galli*, iii. 501.
—— *crus-pavonis*, iii. 501.
—— cyanescens, iii. 487.
—— decolorans, iii. 487.
—— *dichotomum*, iii. 485.
—— diffusum, iii. 487.
—— disciferum, iii. 488.
—— *dispersum*, iii. 484.
—— *dissitiflorum*, iii. 503.
—— *distans*, iii. 494.
—— distichum, iii. 488.
—— *distichum*, iii. 494.
—— divaricatum, iii. 488; iv. 114.
—— *divaricatum*, iii. 494.
—— *duchassaingii*, iii. 490.
Panicum elatius, iii. 491.
—— elephantipes, iii. 488.
—— excelsum, iii. 488.
—— *exile*, iii. 503.
—— expansum, iii. 488.
—— fasciculatum, iii. 488.
—— *filiforme*, iii. 478.
—— fimbriatum, iii. 488.
—— *fimbriatum*, iii. 489; iv. 279.
—— flabellatum, iii. 489.
—— *flavum*, iii. 504.
—— francavillanum, iii. 489.
—— *francoi*, iii. 501.
—— *fusco-rubens*, iii. 488.
—— fuscum, iii. 489.
—— *fuscum*, iii. 487.
—— ——, var. *fasciculatum*, iii. 488.
—— *geniculatum*, iii. 504.
—— ghiesbreghtii, iii. 489.
—— *glandulosum*, iii. 497.
—— *glaucum*, iii. 504.
—— glutinosum, iii. 489.
—— *glutinosum*, iii. 488.
—— gouini, iii. 489.
—— hænkeanum, iii. 489.
—— *hemignostum*, iii. 500.
—— hians, iii. 489.
—— *hirsutum*, iii. 495.
—— hirticaulum, iii. 490.
—— *holciforme*, iii. 501.
—— ichnanthoides, iii. 490.
—— *imberbe*, iii. 504.
—— inæquale, iii. 490.
—— kegelii, iii. 490.
—— kunthii, iii. 490.
—— *lanatum*, var. *sorghoideum*, iii. 496.
—— langei, iii. 490.
—— *latifolium*, iii. 488.
—— ——, var. *altissimum*, iii. 491.
—— laxum, iii. 490.
—— *leandri*, iii. 494.
—— leiophyllum, iii. 490.
—— leptostachyum, iii. 490.
—— leucophæum, iii. 490; iv. 114.
—— liebmannianum, iii. 491.
—— ——, var. depauperatum, iii. 491.
—— lindeni, iii. 491.
—— linkianum, iii. 491.
—— *loliaceum*, iii. 502.
—— *macrostachyum*, iii. 504, 505.
—— maculatum, iii. 491.
—— maximum, iii. 491; iv. 165.
—— megiston, iii. 491.
—— microspermum, iii. 492.
—— *milioides*, iii. 489.

Panicum molle, iii. 492.
—— *monostachyum*, iii. 499.
—— myosurus, iii. 492.
—— myurum, iii. 492.
—— *nemorosum*, iii. 500.
—— nervosum, iii. 492.
—— neuranthum, iii. 492.
—— nitidum, iii. 493.
—— *nitidum*, iii. 485.
—— oaxacense, iii. 493.
—— obtectum, iii. 493.
—— obtusum, iii. 493.
—— *onurus*, iii. 505.
—— *oryzoides*, iii. 498.
—— *pallens*, iii. 496, 500.
—— ——, var. *angustifolium*, iii. 496.
—— *paniculiferum*, iii. 505.
—— *parciflorum*, iii. 502.
—— paspalodes, iii. 493.
—— patentissimum, iii. 493.
—— *pauciflorum*, iii. 497.
—— phleiforme, iii. 494.
—— pilosum, iii. 494.
—— *pilosum*, var. *leiogonum*, iii. 495.
—— plantagineum, iii. 494.
—— *polygamum*, iii. 491.
—— *polygonatum*, iii. 490.
—— polygonoides, iii. 494.
—— *pregnans*, iii. 494.
—— prorepens, iii. 494.
—— pulchellum, iii. 494.
—— *pumilo*, iii. 489.
—— *purpurascens*, iii. 504.
—— *rariflorum*, iii. 495, 503, 576.
—— rectum, iii. 494.
—— reflexopilum, iii. 494.
—— repens, iii. 495.
—— rhizophorum, iii. 495.
—— *rugosum*, iii. 506.
—— rugulosum, iii. 495.
—— ruprechtii, iii. 495.
—— ruscifolium, iii. 495.
—— *saccharoides*, iii. 490.
—— *salzmanni*, iii. 484.
—— sanguinale, var., iv. 114.
—— *sanguinale*, iii. 491, 489, 496; iv. 94, 109.
—— scaberrimum, iii. 496.
—— *schiederi*, iii. 577.
—— schlechtendalii, iii. 496.
—— sciaphilum, iii. 496.
—— scoparium, iii. 496.
—— *setarium*, iii. 502.
—— *sellowi*, var. *longevaginatum*, iii. 495.
—— sorghoideum, iii. 496.
Panicum spectabile, iii. 502.
—— squamatum, iii. 496.
—— stipatum, iii. 496.
—— stoloniferum, iii. 496.
—— *striatum*, iii. 492.
—— sulcatum, iii. 496, 506.
—— *sylvaticum*, iii. 502; iv. 301.
—— *tenuiculmum*, iii. 494.
—— thrasya, iii. 497.
—— torreyi, iii. 497.
—— *trichanthum*, iii. 492.
—— *trichoides*, iii. 486, 492.
—— umbrosum, iii. 497.
—— uncinatum, iii. 497.
—— unisetum, iii. 498; iv. 94.
—— *unisetum*, iii. 506.
—— velutinosum, iii. 498.
—— *verrucosum*, iii. 497.
—— vicarium, iii. 498.
—— vilfoides, iii. 498.
—— *villiferum*, iii. 485.
—— violascens, iii. 498.
—— virgatum, iii. 498.
—— *virgatum*, iii. 485.
—— virletii, iii. 498.
—— *viscidum*, iii. 493.
—— *zelayense*, iii. 502.
—— zizanioides, iii. 498.
Pankea insignis, i. 401.
Papaver, i. 28.
PAPAVERACEÆ, i. 26; iv. 4, 97.
Papaveraceæ, iv. 172, 204, 214, 216, 224, 229.
Papaya vulgaris, i. 481.
PAPAYEÆ, i. 481.
PAPILIONACEÆ, i. 225.
Papilionaceæ, iv. 178.
PAPPERITZIA, iii. 272.
Papperitzia leiboldi, iii. 272.
PAPPOPHORUM, iii. 567.
Pappophorum alopecuroides, iii. 568.
—— apertum, iii. 567.
—— bicolor, iii. 568.
—— *boreale*, iii. 568.
—— laguroideum, iii. 568.
—— mexicanum, iii. 568.
—— *pallida*, iii. 568.
—— wrightii, iii. 568.
Parabesleria costaricensis, ii. 488.
—— *triflora*, ii. 488.
PARATHESIS, ii. 290.
Parathesis corymbosa, ii. 291.
—— crenulata, ii. 291.
—— melanosticta, ii. 291.
—— trichogyne, ii. 291.
PARIETARIA, iii. 161.
Parietaria, iv. 149.
Parietaria debilis, iii. 161.
—— *linguæfolia*, iii. 161.
—— *microphylla*, iii. 157.
—— *orizabæ*, iii. 161.
—— pennsylvanica, iii. 161; iv. 293.
—— *serpyllifolia*, iii. 158.
Paritium azanzæ, i. 121.
—— *tiliaceum*, iv. 162, 165.
Parkeria pteroides, iii. 625.
PARKIA, i. 342.
PARKIEÆ, i. 342.
PARKINSONIA, i. 327.
Parkinsonia, iv. 230.
Parkinsonia aculeata, i. 327.
—— microphylla, i. 327.
—— torreyana, i. 327.
Parmelia, iv. 148, 149.
—— *centralis*, iv. 150, 151.
—— *encausta*, iv. 150.
PARMENTIERA, ii. 497.
Parmentiera aculeata, ii. 498.
—— alata, ii. 498.
—— cereifera, ii. 498.
—— edulis, ii. 498.
—— *foliolosa*, ii. 498.
—— *lanceolata*, ii. 498.
PARONYCHIA, iii. 10.
Paronychia jamesii, iii. 11.
—— mexicana, iii. 11.
—— *polycnemoides*, iii. 10.
—— *ramosissima*, iii. 10.
Paronychieæ, iv. 225.
PARTHENICE, ii. 149.
Parthenice mollis, ii. 149.
PARTHENIUM, ii. 148.
Parthenium argentatum, ii. 148; iv. 55.
—— confertum, iv. 55.
—— fruticosum, ii. 148.
—— hysterophorus, ii. 148; iv. 55, 103, 112.
—— incanum, ii. 148.
—— lyratum, iv. 55.
—— *ramosissimum*, ii. 148.
—— tomentosum, ii. 148.
PASPALUM, iii. 476.
Paspalum, iii. 483; iv. 148, 157, 213.
Paspalum abbreviatum, iii. 476.
—— acuminatum, iii. 476.
—— affine, iii. 476.
—— *affine*, iii. 482.
—— *antillense*, iii. 481.
—— appendiculatum, iii. 476.
—— *ciliatifolium*, iii. 478.
—— *ciliatum*, iii. 479.
—— compressum, iii. 476.
—— *compressum*, iv. 232.

Paspalum conjugatum, iii. 477; iv. 114.
—— conspersum, iii. 477.
—— convexum, iii. 477.
—— cordovense, iii. 477.
—— curvistachyum, iii. 477.
—— cymbiforme, iii. 477.
—— debile, iii. 478.
—— distichum, iii. 478.
—— effusum, iii. 478.
—— *elegans*, iii. 482.
—— fasciculatum, iii. 478.
—— fastigiatum, iii. 478.
—— filiforme, iii. 478.
—— fluitans, iii. 479.
—— *furcatum*, iii. 480.
—— *fuscum*, iii. 479.
—— gracile, iii. 479.
—— hartwegianum, iii. 479.
—— humboldtianum, iii. 479.
—— karwinskii, iii. 479.
—— *lanatum*, iii. 483.
—— *lentiferum*, iii. 479.
—— lentiginosum, iii. 479.
—— liebmannii, iii. 479.
—— lineare, iii. 479.
—— *littorale*, iii. 478.
—— lividum, iii. 480.
—— macrophyllum, iii. 480.
—— mandioccanum, iii. 480.
—— minus, iii. 480.
—— mononeuron, iii. 480.
—— *monostachyum*, iii. 482.
—— notatum, iii. 480.
—— *notatum*, iv. 165.
—— *oajacense*, iii. 499.
—— obtusifolium, iii. 480.
—— *orbiculatum*, iii. 481.
—— paniculatum, iii. 480.
—— *paniculatum*, iv. 232.
—— pauperculum, iii. 481.
—— *piliferum*, iii. 480.
—— *pilosum*, iii. 478.
—— planifolium, iii. 481.
—— *platycaule*, iii. 476.
—— plicatulum, iii. 481.
—— pubiflorum, iii. 481.
—— ——, var. viride, iii. 481.
—— pumilum, iii. 481.
—— pusillum, iii. 481.
—— pyramidale, iii. 482.
—— *renggeri*, iii. 477.
—— rudimentosum, iii. 482.
—— saccharoides, iii. 482.
—— *saccharoides*, iii. 519.
—— schaffneri, iii. 482.
—— *senescens*, iii. 482.
Paspalum setaceum, iii. 478.
—— squamulatum, iii. 482.
—— stellatum, iii. 482.
—— sumichrastii, iii. 482.
—— *supinum*, iii. 480.
—— tenellum, iii. 482.
—— ——, var. bourgæi, iii. 482.
—— *tenellum*, iii. 476.
—— triglume, iii. 482.
—— *tristachyon*, iii. 476.
—— *undulatum*, iii. 481.
—— *vaginatum*, iii. 478.
—— velutinum, iii. 483.
—— *virgatum*, iii. 479; iv. 165.
—— virletii, iii. 483.
Paspalus inæqualis, iii. 490.
PASSIFLORA, i. 475.
Passiflora, iv. 119, 213, 245.
—— *acerifolia*, i. 476.
—— adenophylla, i. 476.
—— adenopoda, i. 476.
—— alnifolia, i. 476.
—— andersonii, iv. 100.
—— argentea, i. 480.
—— auriculata, i. 476.
—— bilobata, i. 476.
—— bryonioides, i. 476.
—— capsularis, i. 476.
—— *capsularis*, i. 481.
—— ceratosepala, i. 476.
—— ciliata, i. 477.
—— *clypeata*, i. 476.
—— *contrayerva*, i. 476.
—— coriacea, i. 476.
—— costata, i. 478.
—— cuneata, i. 477.
—— dictamo, i. 477.
—— *difformis*, i. 476.
—— *discolor*, i. 478.
—— *divaricata*, i. 479.
—— edulis, i. 477.
—— erythrophylla, i. 477.
—— *exudans*, i. 476.
—— filipes, i. 477.
—— *floribunda*, i. 480.
—— fœtida, i. 477; iv. 100, 112.
—— fuscinata, i. 477.
—— *glabrata*, i. 478.
—— glauca, i. 477.
—— gossypifolia, i. 477.
—— hahnii, i. 477.
—— hastata, i. 477.
—— helleri, i. 478.
—— hirsuta, i. 477, 480.
—— hispidula, i. 478.
—— holosericea, i. 478.
—— inamœna, i. 478.
Passiflora jorullensis, i. 478.
—— karwinskii, i. 478.
—— laurifolia, i. 478.
—— liebmannii, i. 478.
—— ligularis, i. 478.
—— *lowei*, i. 478.
—— lunata, i. 478.
—— maximiliana, i. 478.
—— *medusæa*, i. 478.
—— membranacea, i. 479.
—— mexicana, i. 479.
—— minima, i. 480.
—— multiflora, i. 479.
—— *odora*, i. 480.
—— œrstedii, i. 479.
—— pallens, i. 479.
—— pannosa, i. 479.
—— pilosa, i. 479.
—— pulchella, i. 479.
—— quadrangularis, i. 479.
—— quadriglandulosa, i. 479.
—— reflexiflora, i. 479.
—— *rohrii*, i. 476.
—— rubra, i. 479.
—— seemannii, i. 480.
—— serratifolia, i. 480.
—— *serratistipula*, i. 478.
—— sexflora, i. 480.
—— sicyoides, i. 480.
—— spathulata, i. 480.
—— suberosa, i. 480.
—— *trisetosa*, i. 477.
—— tuberosa, i. 480.
—— *tubiflora*, i. 480.
—— *vespertilio*, i. 478.
—— viridiflora, i. 480.
—— vitifolia, i. 481.
PASSIFLORACEÆ, i. 475; iv. 100.
Passifloraceæ, iv. 217, 245.
PASSIFLOREÆ, i. 475; iv. 181, 203.
Pauletia aculeata, i. 338.
—— andrieuxii, i. 336.
—— *inermis*, i. 337.
PAULLINIA, i. 209.
Paullinia, iv. 23, 147, 262.
Paullinia barbadensis, i. 209.
—— *carthaginensis*, i. 206.
—— clavigera, i. 210.
—— costata, i. 210.
—— *curassavica*, i. 206; iv. 111.
—— cururu, i. 210.
—— *diversiflora*, i. 210.
—— *fusca*, i. 210.
—— *fuscescens*, i. 210.
—— *glabra*, i. 206.

Paullinia guatemalensis, i. 210.
—— *hostmanni*, i. 210.
—— *macrostachya*, i. 207.
—— *mexicana*, i. 207.
—— *nitida*, i. 210.
—— pinnata, i. 210.
—— *pinnata*, iv. 230.
—— polystachya, i. 210.
—— pteropoda, i. 210.
—— *riparia*, i. 210.
—— velutina, i. 210.
PAUSANDRA, iii. 118.
Pausandra morisiana, iii. 118.
PAVONIA, i. 116.
Pavonia alba, i. 116.
—— arachnoidea, i. 116.
—— aristata, i. 117.
—— *bracteosa*, i. 117.
—— *caracasana*, i. 116.
—— *communis*, i. 117.
—— *corymbosa*, i. 116.
—— genuina, i. 117.
—— glandulosa, i. 116.
—— grandiflora, i. 117.
—— heterophylla, i. 116.
—— hirtiflora, i. 116.
—— lanceolata, i. 116.
—— *lasiopetala*, i. 118.
—— *malacophylla*, i. 117.
—— mexicana, i. 116.
—— mutisii, i. 116.
—— nemoralis, i. 117.
—— oblongifolia, i. 117.
—— ovalifolia, i. 117.
—— paniculata, i. 116; iv. 14.
—— racemiflora, i. 117.
—— racemosa, i. 116.
—— rosea, i. 117.
—— scabra, i. 117.
—— sessiliflora, i. 117.
—— *spicata*, i. 116.
—— spinifex, i. 117.
—— typhalea, i. 117; iv. 14.
—— *typhalea*, i. 118.
—— urticæfolia, i. 117.
—— velutina, i. 117.
—— wrightii, i. 118.
Pectidopsis angustifolia, ii. 224.
PECTIS, ii. 224.
Pectis, iv. 140, 252.
Pectis angustifolia, ii. 224; iv. 62.
—— arenaria, ii. 224.
—— auricularis, ii. 224.
—— *auricularis*, iv. 62.
—— berlandieri, ii. 225.
—— *berlandieri*, iv. 62.
—— bonplandiana, ii. 225.
Pectis canescens, ii. 225; iv. 62.
—— *canescens*, ii. 224, 226.
—— capillaris, ii. 225.
—— capillipes, ii. 225.
—— coulteri, ii. 225.
—— diffusa, ii. 225.
—— elongata, ii. 225.
—— fasciculiflora, ii. 225.
—— *fastigiata*, ii. 224.
—— *filipes*, ii. 225; iv. 62.
—— hænkeana, ii. 225.
—— imberbis, ii. 225.
—— jaliscana, ii. 225.
—— *latisquama*, iv. 62.
—— liebmanni, ii. 226.
—— longipes, ii. 226.
—— *longipes*, iv. 62.
—— multiflosculosa, ii. 226.
—— *multiflosculosa*, ii. 224.
—— papposa, ii. 226.
—— prostrata, ii. 226; iv. 62.
—— satureioides, ii. 226.
—— *satureioides*, iv. 62.
—— *seemannii*, ii. 210.
—— swartziana, ii. 226.
—— *taliscana*, ii. 225.
—— tenella, ii. 226; iv. 62.
—— uniaristata, ii. 227; iv. 62.
—— ——, var. holostemma, iv. 62.
Pectocarya, ii. 379.
Pectothrix, ii. 226.
PEDALINEÆ, ii. 499.
Pedalineæ, iv. 189, 205.
PEDICULARIS, ii. 466.
Pedicularis æquinoctialis, ii. 467.
—— angustifolia, ii. 467.
—— canadensis, ii. 467.
—— mexicana, ii. 467.
—— orizabæ, ii. 467.
—— *orizabæ*, iv. 150, 292.
—— procera, ii. 467.
—— tripinnata, ii. 467.
PEDILANTHUS, iii. 88.
Pedilanthus aphyllus, iii. 89.
—— articulatus, iii. 89.
—— bracteatus, iii. 89.
—— finckii, iii. 89.
—— ghiesbreghtianus, iii. 89.
—— involucratus, iii. 89.
—— œrstedii, iii. 89.
—— *parasiticus*, iii. 89.
—— pavonis, iii. 89.
—— ramosissimus, iii. 89.
—— tithymaloides, iii. 89.
Pedilea, iii. 210.
Pedinochilus benthamii, iii. 42.
—— *fœtida*, iii. 42.
Pedinochilus hoffmannii, iii. 43.
PEGANUM, i. 167.
Peganum, iv. 238.
Peganum mexicanum, i. 167.
—— *mexicanum*, iv. 140.
PELARGONIEÆ, i. 161.
Pelargonium, i. 161.
PELECYPHORA, i. 528.
Pelecyphora ascelliformis, i. 528.
PELEXIA, iii. 303.
Pelexia hoffmanni, iii. 299.
PELLÆA, iii. 618.
Pellæa, iv. 140, 281, 282.
Pellæa alabamensis, iii. 618.
—— andromedæfolia, iii. 618.
—— angustifolia, iii. 618; iv. 116.
—— aspera, iii. 618.
—— atropurpurea, iii. 618.
—— cordata, iii. 619.
—— *cordata*, iii. 619.
—— *cuneata*, iii. 618.
—— *decomposita*, iii. 618.
—— *ferruginea*, iii. 674.
—— *flavescens*, iii. 619.
—— *flexuosa*, iii. 619.
—— fournieri, iii. 619.
—— *geraniæfolia*, iii. 619.
—— glauca, iii. 619.
—— *glauca*, iii. 620.
—— *hirsuta*, iii. 619.
—— intramarginalis, iii. 620.
—— *lanuginosa*, iii. 621.
—— marginata, iii. 620.
—— *marginata*, iii. 620.
—— *mucronata*, iii. 619.
—— pallida, iii. 620.
—— pulchella, iii. 620.
—— rigida, iii. 621.
—— *sagittata*, iii. 619.
—— seemanni, iii. 621.
—— skinneri, iii. 621.
—— ternifolia, iii. 621.
Pelliceria, i. 96; iv. 237.
PELLICIERA, i. 96.
Pelliciera rhizophoræ, i. 97.
Peltigera, iv. 149.
PELTOPHORUM, i. 323.
Penæaceæ, iii. 79; iv. 192.
PENNISETUM, iii. 507.
Pennisetum bambusiforme, iii. 507.
—— complanatum, iii. 507.
—— *complanatum*, iii. 508.
—— *distachyum*, iii. 509; iv. 301.
—— flavescens, iii. 508.
—— *geniculatum*, iii. 504.
—— humboldtianum, iii. 508.
—— karwinskii, iii. 508.

Pennisetum mexicanum, iii. 508.
—— multiflorum, iii. 508.
—— nervosum, iii. 508.
—— nicaraguense, iii. 508.
—— *purpurascens*, iii. 508.
—— setosum, iii. 508.
—— tristachyum, iii. 509.
—— uniflorum, iii. 509.
PENTACÆNA, iii. 10.
Pentacæna polycnemoides, iii. 10.
—— *polycnemoides*, iii. 10.
—— *ramosissima*, iii. 10.
PENTACHÆTA, ii. 113.
Pentachæta gracilis, ii. 113.
Pentaclathra, i. 493.
PENTACLETHRA, i. 343.
Pentaclethra, iv. 230.
Pentaclethra filamentosa, i. 343.
Pentacrophys wrightii, iii. 6.
Pentacrypta atropurpurea, i. 564.
Pentadenia nervosa, ii. 486.
PENTAGONIA, ii. 38.
Pentagonia macrophylla, ii. 38.
—— tinajita, ii. 38.
—— wendlandii, ii. 38.
Pentalophus longiflorus, ii. 381.
—— *mandanensis*, ii. 381.
Pentapetes ovata, i. 129.
PENTARHAPHIA, ii. 481.
Pentarhaphia, ii. 481.
Pentarhaphia cuneifolia, ii. 481.
—— pedunculosa, ii. 481.
—— tenera, ii. 482.
Pentarrhaphis scabra, iii. 560.
PENTSTEMON, ii. 443.
Pentstemon, iv. 229, 257.
Pentstemon acuminatus, ii. 443.
—— ambiguus, ii. 443.
—— *angustifolius*, ii. 444.
—— *atropurpureus*, ii. 444.
—— baccharifolius, ii. 443.
—— barbatus, ii. 443.
—— campanulatus, ii. 444; iv. 76.
—— cleavelandi, ii. 444.
—— *coccineus*, ii. 444, 445.
—— *connatus*, ii. 445.
—— *cordatus*, ii. 445.
—— dasyphyllus, ii. 444.
—— *elegans*, ii. 444.
—— *fendleri*, ii. 443; iv. 141.
—— gentianoides, ii. 444.
—— *gentianoides*, ii. 445; iv. 291.
—— *grahami*, iv. 140.
—— hallii, var. arizonicus, ii. 445.
—— hartwegii, ii. 445.
—— *humboldtii*, ii. 445.
—— imberbis, ii. 445.
Pentstemon kunthii, ii. 444.
—— lanceolatus, ii. 445.
—— linarioides, ii. 445.
—— perfoliatus, ii. 445.
—— *perfoliatus*, iv. 291.
—— *pulchellus*, ii. 444.
—— puniceus, ii. 445.
—— *roseus*, ii. 444.
—— rubescens, iv. 76.
—— schaffneri, ii. 443.
—— secundiflorus, ii. 446.
—— stenophyllus, ii. 446.
—— tenuifolius, ii. 446.
—— thurberi, ii. 443.
—— torreyi, ii. 444.
—— *torreyi*, iv. 141.
—— *verticillatus*, ii. 445.
—— wislizeni, ii. 444.
PEPEROMIA, iii. 58.
Peperomia, iv. 159, 212, 259.
Peperomia aguacatensis, iii. 58.
—— alata, iii. 58.
—— amantlanensis, iii. 58.
—— arboricola, iii. 58.
—— asarifolia, iii. 58.
—— bernouillii, iii. 58.
—— blanda, iii. 58.
—— botterii, iii. 58.
—— bourgeaui, iii. 59; iv. 84.
—— camptotricha, iii. 59.
—— carthaginensis, iii. 59.
—— ciliolata, iii. 59.
—— *circinata*, iii. 59.
—— claytonioides, iii. 59.
—— consoquitlana, iii. 59.
—— cordovana, iii. 59.
—— cordulata, iii. 59.
—— coulteri, iii. 59.
—— cyclophylla, iii. 59.
—— dendrophila, iii. 60.
—— deppeana, iii. 60.
—— distachya, iii. 60.
—— donaguiana, iii. 60.
—— drusophila, iii. 60.
—— edulis, iii. 60.
—— epidendron, iii. 60.
—— erasmia, iii. 60.
—— fraseri, iii. 60.
—— fugax, iii. 60.
—— galeottiana, iii. 60.
—— galeottii, iii. 60.
—— galioides, iii. 60.
—— glabella, iii. 61.
—— guadalupensis, iii. 61.
—— hernandiæfolia, iii. 61.
—— hispidula, iii. 61.
—— hoffmannii, iii. 61.
Peperomia huatuscoana, iii. 61.
—— jarisiana, iii. 61.
—— lanceolatopeltata, iii. 61.
—— lancifolia, iii. 61.
—— langsdorffi, iii. 61.
—— leptophylla, iii. 61.
—— liebmanniana, iii. 61.
—— liebmannii, iii. 62.
—— lignescens, iii. 62.
—— lindeniana, iii. 62.
—— *lindeniana*, iv. 293.
—— magnoliæfolia, iii. 62.
—— matlalucaensis, iii. 62.
—— melanostigma, iii. 62.
—— metapalcoensis, iii. 62.
—— mexicana, iii. 62.
—— microphylla, iii. 62.
—— miradoresiana, iii. 62.
—— mülleri, iii. 62.
—— muscophila, iii. 63.
—— naranjoana, iii. 63.
—— nummularifolia, iii. 63.
—— *nummularifolia*, iii. 59.
—— œrstedii, iii. 63.
—— *œrstedii*, iv. 293.
—— olivacea, iii. 63.
—— ovato-peltata, iii. 63.
—— oxycarpa, iii. 63.
—— pallescens, iii. 63.
—— papantlensis, iii. 63.
—— pellucida, iii. 63.
—— *pellucida*, iv. 231.
—— perforata, iii. 63.
—— petiolaris, iii. 63; iv. 84.
—— petrophila, iii. 64; iv. 84.
—— plicata, iii. 64.
—— portobellensis, iii. 64.
—— producta, iii. 64.
—— pseudoamplexicaulis, iii. 64.
—— *pulicaris*, iii. 65.
—— quadrifolia, iii. 64.
—— quaternata, iii. 64.
—— reflexa, iii. 64.
—— reticulata, iii. 58.
—— *rotundifolia*, iii. 62.
—— rubella, iii. 64.
—— rubioides, iii. 64.
—— rubrinodis, iii. 64.
—— rupestris, iii. 65.
—— sanjoseana, iii. 65.
—— scandens, iii. 65.
—— *schiedeana*, iii. 65.
—— seemanniana, iii. 65.
—— tenerrima, iii. 65.
—— tenuiflora, iii. 65.
—— tenuifolia, iii. 65.
—— tlapacoyoensis, iii. 65.

Peperomia tuberosa, iii. 65.
—— turialvensis, iii. 65.
—— umbilicata, iii. 65.
PEPONOPSIS, i. 483.
Peponopsis adhærens, i. 484.
Peraltea lupinoides, i. 253.
—— *oxyphylla*, i. 254, 256.
Perdicium cordatum, ii. 256.
Pereilema, iii. 543.
PERESKIA, i. 555.
Pereskia bleo, i. 555.
—— calandriniæfolia, i. 555.
—— lychnidiflora, i. 555.
—— opuntiæflora, i. 555.
—— pititache, i. 555.
—— rotundifolia, i. 555.
—— spathulata, i. 555.
—— zinniæflora, i. 555.
PEREZIA, ii. 255.
Perezia, iv. 213, 252.
Perezia adnata, ii. 255.
—— *adnata*, iv. 64.
—— alamani, ii. 255.
—— *alamani*, iv. 64.
—— *arizonica*, iv. 65.
—— carpholepis, iv. 64.
—— coulteri, ii. 256.
—— *coulteri*, iv. 65.
—— dugesii, iv. 64.
—— formosa, iv. 65.
—— fruticosa, ii. 256.
—— *fruticosa*, iv. 64.
—— hebeclada, ii. 256.
—— humboldtii, ii. 256; iv. 65.
—— moschata, ii. 256.
—— nana, ii. 256.
—— nudicaulis, ii. 256.
—— oxylepis, ii. 256.
—— parryi, ii. 256.
—— patens, ii. 255.
—— *patens*, iv. 64.
—— platyphylla, ii. 256.
—— reticulata, ii. 256.
—— *reticulata*, iv. 65, 289.
—— rigida, ii. 257.
—— runcinata, ii. 257.
—— seemannii, ii. 257.
—— thurberi, ii. 257.
—— *thurberi*, iv. 65.
—— thyrsoidea, ii. 257.
—— turbinata, ii. 257; iv. 65.
—— wislizenii, ii. 257.
—— wrightii, iv. 65.
PERICOME, ii. 214.
Pericome caudata, ii. 214.
—— spilanthoides, ii. 215.
PERIEILEMA, ii. 543.
Perieilema ciliatum, iii. 543.
—— crinitum, iii. 544.
—— setarioides, iii. 544.
PERILOMIA, ii. 570.
Perilomia cordifolia, ii. 569.
—— *fruticosa*, ii. 569.
—— tomentosa, ii. 570.
PERIPTERA, i. 113.
Periptera punicea, i. 113.
PERISTERIA, iii. 259.
Peristeria barkeri, iii. 259.
—— *cerina*, iii. 252.
—— elata, iii. 259.
—— *humboldtii*, iii. 260.
—— *longiscapa*, iii. 253.
PERITYLE, ii. 210.
Perityle aglossa, ii. 210; iv. 142.
—— *coronopifolia*, ii. 210.
—— microglossa, ii. 210.
—— *nuda*, iv. 142.
—— *parryi*, iv. 142.
PERNETTYA, ii. 280.
Pernettya, iv. 234, 254.
Pernettya buxifolia, ii. 280.
—— *buxifolia*, iv. 290.
—— ciliaris, ii. 280.
—— coriacea, ii. 280.
—— *coriacea*, iv. 159.
—— pilosa, ii. 280.
—— *pilosa*, iv. 290.
—— setigera, ii. 280.
PERROTTETIA, i. 190.
Perrottetia ovata, i. 190.
—— quindiuensis, i. 190.
PERSEA, iii. 71.
Persea amplexicaulis, iii. 71.
—— areolata, iii. 71.
—— cærulea, iii. 72.
—— cinnamomifolia, iii. 71.
—— drimyfolia, iii. 71.
—— effusa, iii. 71.
—— gratissima, iii. 71.
—— *gratissima*, iv. 147, 301.
—— hartwegii, iii. 72.
—— lævigata, iii. 72.
—— longipes, iii. 72.
—— mexicana, iii. 72.
—— oblonga, iii. 71.
—— orizabæ, iii. 72.
—— *orizabæ*, iv. 293.
—— pachypoda, iii. 72.
—— parvifolia, iii. 71.
—— salicifolia, iii. 72.
—— schiedeana, iii. 71.
—— veraguensis, iii. 72.
—— vulgaris, iii. 71.
PERYMENIUM, ii. 180.
Perymenium barclayanum, ii. 180.
—— berlandieri, ii. 181.
—— buphthalmoides, ii. 181.
—— cervantesii, ii. 181.
—— *cervantesii*, iv. 288.
—— discolor, ii. 181.
—— gracile, ii. 181.
—— grande, ii. 181.
—— gymnolomoides, ii. 182.
—— mendezii, ii. 182.
—— parvifolium, ii. 182.
—— tenellum, ii. 182.
—— verbesinoides, ii. 182.
Perytile parryi, ii. 210.
Pescatoria cerina, iii. 251.
Peschiera litoralis, ii. 309.
PETALONYX, i. 472.
Petalonyx crenatus, iv. 38.
—— thurberi, i. 472.
PETALOSTEMON, i. 249.
Petalostemon, iv. 239.
Petalostemon candidum, i. 250.
—— exile, i. 250.
Petasostylis nigrescens, ii. 345.
—— *saponarioides*, ii. 345.
Petastoma patellifera, ii. 491.
PETERIA, i. 256.
Peteria scoparia, i. 256.
—— *scoparia*, iv. 140.
Peterostemon, iv. 240.
Petesia grandis, ii. 38.
—— *minor*, ii. 38.
PETITIA, ii. 538.
Petitia oleina, ii. 539.
PETIVERIA, iii. 29.
Petiveria alliacea, iii. 29.
—— *ochroleuca*, iii. 29.
PETRÆA, ii. 535.
Petræa arborea, ii. 536; iv. 113.
—— *erecta*, ii. 536.
—— *mexicana*, ii. 536.
—— *ovata*, ii. 536.
—— volubilis, ii. 536.
PETUNIA, ii. 436.
Petunia parviflora, ii. 436.
—— villadiana, ii. 436.
—— viscidula, ii. 436.
PEUCEDANEÆ, i. 570.
PEUCEDANUM, i. 570.
Peucedanum mexicanum, iv. 46.
—— nevadense, i. 570.
—— tolucense, i. 570.
—— *tolucense*, iv. 286.
Peucephyllum, ii. 229.
—— *schotti*, ii. 229.
Peyritschia kœlerioides, iii. 555.

Pfaffia, iii. 16.
Phaca astragalina, i. 267.
—— *candolliana*, i. 266.
—— coriacea, i. 263.
—— *elongata*, i. 266.
—— guatemalensis, i. 264.
—— *mollis*, i. 264.
—— *triflora*, i. 266.
PHACELIA, ii. 358.
Phacelia, ii. 360; iv. 149, 151.
Phacelia ciliata, ii. 358.
—— circinata, ii. 359.
—— *circinata*, iv. 255.
—— congesta, ii. 359.
—— glandulosa, ii. 359.
—— infundibuliformis, ii. 359.
—— integrifolia, ii. 359.
—— micrantha, ii. 359.
—— pimpinelloides, ii. 359.
—— *pimpinelloides*, iv. 291.
—— *popei*, ii. 359.
Phædranthus buccinatorum, ii. 490.
—— *cinerascens*, ii. 490.
—— *exsertus*, ii. 490.
—— *lindleyanus*, ii. 490.
Phæospherion, iii. 386.
—— *leiocarpum*, iii. 386.
—— *persicariæfolium*, iii. 386.
Phalacræa lindeni, ii. 79.
Phalangium, iii. 374.
Phalangium aurantiacum, iv. 91.
—— *ciliatum*, iii. 374.
—— *flavescens*, iv. 91.
—— macrophyllum, iv. 91.
—— *pusillum*, iv. 91.
—— *scabrellum*, iii. 375.
PHALARIDEÆ, iii. 531.
PHALARIS, iii. 531.
Phalaris americana, iii. 531, 532.
—— arundinacea, iii. 531.
—— *arundinacea*, iii. 532; iv. 279.
—— *intermedia*, iii. 531, 532.
—— *minor*, iii. 531.
Phanerogamæ, iv. 208, 209, 218, 219.
Phanerophlebia juglandifolia, iii. 642.
—— *lindeni*, iii. 642.
—— *nobilis*, iii. 642.
—— *pumila*, iii. 642.
—— *remotispora*, iii. 642.
Phanerostylis coahuilensis, iv. 50.
PHANIA, ii. 78.
Phania arbutifolia, ii. 81.
—— *dissecta*, ii. 94.
—— trinervia, ii. 78.
—— *urenæfolia*, ii. 91.
Pharbitis acuminata, ii. 383.
—— *cuspidata*, ii. 389.
—— *dealbata*, ii. 386.
—— *diversifolia*, ii. 390.
—— *grandiflora*, ii. 387.
—— *heterophylla*, ii. 388.
—— *hispida*, ii. 393.
—— *jamaicensis*, iv. 105.
—— *learii*, ii. 388.
—— *lilacina*, ii. 389.
—— *lindenii*, ii. 389.
—— *longepedunculata*, ii. 389.
—— *pubescens*, ii. 392.
—— *serotina*, ii. 393.
—— *speciosa*, ii. 389.
—— *tomentosa*, ii. 388.
—— *tyrianthina*, ii. 395.
Pharium fistulosum, iii. 377.
Pharmacosycea angustifolia, iii. 147.
—— *anthelminticā*, iii. 143.
—— *glaucescens*, iii. 145.
—— *hernandezii*, iii. 145.
—— *mexicana*, iii. 146.
—— *pseudoradula*, iii. 147.
—— *radula*, iii. 147.
—— *rigida*, iii. 144.
PHARUS, iii. 510.
Pharus, iv. 280.
—— *brasiliensis*, var. *mexicana*, iii. 510.
—— latifolius, iii. 510.
—— *vittatus*, iii. 510.
PHASEOLEÆ, i. 293.
PHASEOLUS, i. 304.
Phaseolus, iv. 31, 213.
Phaseolus acutifolius, i. 304.
—— adenanthus, var. ?, iv. 112.
—— *adenanthus*, i. 307.
—— *amazonicus*, i. 305.
—— *amœnus*, i. 307.
—— amplus, i. 304.
—— angustissimus, i. 304.
—— anisotrichus, i. 304.
—— atropurpureus, i. 304; iv. 31.
—— bilobatus, i. 304.
—— *canescens*, i. 304.
—— *cirrhosus*, i. 307.
—— dysophyllus, i. 304.
—— falcatus, i. 304.
—— formosus, i. 305.
—— *formosus*, iv. 284.
—— glaber, i. 305.
—— gracilis, i. 305.
—— hernandezii, i. 305.
—— heterophyllus, i. 305.
Phaseolus leptostachyus, i. 305.
—— lunatus, i. 305; iv. 112.
—— macrocarpus, i. 305.
—— macropoides, i. 305.
—— micranthus, i. 306.
—— multiflorus, i. 306.
—— obvallatus, i. 306.
—— *obvallatus*, iv. 284.
—— *parviflorus*, i. 305.
—— *pascuorum*, i. 306.
—— pedicellatus, i. 306.
—— peduncularis, i. 306.
—— polymorphus, iv. 31.
—— retusus, i. 306.
—— rotundifolius, i. 306.
—— *saccharatus*, i. 305.
—— scabrellus, iv. 31.
—— *schiedeanus*, i. 304.
—— semierectus, i. 306; iv. 112.
—— speciosus, i. 306.
—— *spixianus*, i. 306.
—— sylvestris, i. 306.
—— tenuifolius, i. 304.
—— truxillensis, i. 307.
—— vulgaris, i. 307; iv. 112.
—— *xuaresii*, i. 305.
PHAULOTHAMNUS, iv. 83.
Phaulothamnus, iv. 259.
Phaulothamnus spinescens, iv. 83.
Phegopteris alleopteris, iii. 654.
—— blanda, iii. 672.
—— cæspitosa, iii. 655.
—— *cordata*, iii. 668.
—— decussata, iii. 656.
—— *deflexa*, iii. 658.
—— *dissimile*, iii. 656.
—— *divergens*, iii. 646.
—— *effusa*, iii. 646.
—— elongata, iii. 657.
—— *epieroides*, iii. 672.
—— flavopunctata, iii. 658.
—— *galeottii*, iii. 644.
—— glandulifera, iii. 659.
—— hemsleyana, iii. 660.
—— *impressa*, iii. 668.
—— *inæqualis*, iii. 644.
—— *martinicensis*, iii. 652.
—— *megalodus*, iii. 670.
—— melanorrhachis, iii. 672.
—— nicaraguensis, iii. 665.
—— *pilosa*, iii. 668, 678.
—— *pilosula*, iii. 645.
—— *platyphyllum*, iii. 667.
—— polystichoides, iii. 667.
—— refulgens, iii. 668.
—— *rudis*, iii. 649, 668.
—— *seemannii*, iii. 644.

Phegopteris sloanei, iii. 644.
—— *speciosissima*, iii. 616.
—— *spectabilis*, iii. 652.
—— *stenolepis*, iii. 644.
—— *subincisa*, iii. 648.
—— *tetragona*, iii. 645.
—— *wagneri*, iii. 665.
Phelipæa erianthera, ii. 468.
—— *ludoviciana*, ii. 468.
PHENAX, iii. 160.
Phenax angustifolius, iii. 160.
—— *galeottianus*, iii. 161.
—— *gaudichaudianus*, iii. 161.
—— hirtus, iii. 160.
—— mexicanus, iii. 161.
—— sonneratii, iii. 161.
—— *urticæfolius*, iii. 160.
—— *vulgaris*, iii. 161.
PHILACTIS, ii. 152.
Philactis longipes, ii. 152.
—— zinnioides, ii. 152.
PHILADELPHUS, i. 383.
Philadelphus, iv. 240.
Philadelphus affinis, i. 383.
—— mexicanus, i. 384.
—— myrtoides, i. 383.
—— serpyllifolius, i. 384; iv. 35.
—— zeyheri, i. 384.
Philetæria horrida, i. 81.
PHILIBERTIA, ii. 318.
Philibertia crassifolia, ii. 318.
—— crispa, ii. 318.
—— cumanensis, ii. 318.
—— cynanchoides, ii. 318.
—— *cynanchoides*, iv. 290.
—— elegans, ii. 318.
—— heterophylla, ii. 319.
—— lindeniana, ii. 318.
—— linearis, ii. 319.
—— lurida, ii. 319.
—— odorata, ii. 319.
—— pannosa, ii. 320.
—— *pannosa*, ii. 319.
—— pavoni, ii. 319.
—— rotundifolia, ii. 320.
PHILODENDRON, iii. 419.
Philodendron acrocardium, iii. 422.
—— advena, iii. 420.
—— *affine*, iii. 421.
—— anisotomum, iii. 420.
—— augustinum, iii. 420.
—— aurantiifolium, iii. 421.
—— brevispathum, iii. 420.
—— cuspidatum, iii. 421.
—— dæmonum, iii. 421.
—— *dagilla*, iii. 423.
—— fenzlii, iii. 421.
Philodendron fenzlii, iii. 420.
—— ——, *β. anisotomum*, iii. 420, 421.
—— gracile, iii. 421.
—— hoffmannii, iii. 421.
—— *impolitum*, iii. 422.
—— inæquilaterum, iii. 421.
—— *isertianum*, iii. 422.
—— ligulatum, iii. 421.
—— mexicanum, iii. 421.
—— *micans*, iii. 421.
—— oxycardium, iii. 422.
—— *pertusum*, iii. 426.
—— polytomum, iii. 422.
—— pterotum, iii. 422.
—— radiatum, iii. 422.
—— sagittifolium, iii. 422.
—— sanguineum, iii. 422.
—— schottianum, iii. 422.
—— seguine, iii. 422.
—— subovatum, iii. 422.
—— *tanyphyllum*, iii. 422.
—— tricuspidatum, iii. 423.
—— *tripartitum*, iii. 420, 423.
—— warscewiczii, iii. 423.
—— wendlandi, iii. 423.
PHILOXERUS, iii. 17.
Philoxerus aggregatus, iii. 17.
—— *aggregatus*, iv. 231.
—— vermicularis, iii. 18; iv. 114.
—— *vermicularis*, iv. 231.
Philydraceæ, iv. 197.
PHINÆA, ii. 472.
Phinæa albo-lineata, ii. 472.
—— reticulata, ii. 472.
Phlebodium araneosum, iii. 655.
—— *areolatum*, iii. 655.
—— aureum, iii. 655.
—— decumanum, iii. 656.
—— *lanosum*, iii. 655.
—— *trilobatum*, iii. 655.
PHLEUM, iii. 544.
Phleum alpinum, iii. 544.
—— *alpinum*, iv. 150, 280, 296.
—— *americanum*, iii. 544.
—— hænkeanum, iii. 544.
Phlomostachys atrorubens, iii. 315.
—— *imbricata*, iii. 316.
PHLOX, ii. 353.
Phlox, iv. 229, 255.
Phlox longifolia, ii. 353.
—— nana, ii. 354.
—— *pinnata*, ii. 354.
—— *speciosa*, var. ? *stansburyi*, ii. 353.
—— stansburyi, ii. 353.
—— *triovulata*, ii. 354.
Phœbe effusa, iii. 71.
—— *granatensis*, *β.* ?*œrstedii*, iii. 71.
—— *hartwegii*, iii. 72.
—— *insularis*, iii. 72.
—— *mexicana*, iii. 72.
—— *salicifolia*, iii. 72.
Phœnixopus intybaceus, ii. 262.
PHOLIDOSTACHYS, iii. 410.
Pholidostachys, iv. 276.
Pholidostachys pulchra, iii. 410.
Pholisma arenarium, iv. 254.
PHORADENDRON, iii. 84.
Phoradendron, iv. 148, 149.
Phoradendron angustifolium, iii. 84.
—— annulatum, iii. 84.
—— bolleanum, iii. 84.
—— brachystachyum, iii. 85.
—— brevifolium, iii. 85.
—— californicum, iii. 85.
—— corynarthron, iii. 85.
—— *corynarthron*, iii. 86.
—— flavens, iii. 85.
—— flavescens, iii. 85.
—— hexastichum, iii. 85.
—— juniperinum, iii. 85.
—— latifolium, iii. 85.
—— nervosum, iii. 86.
—— pachyarthron, iii. 86.
—— pauciflorum, iii. 86.
—— reichenbachianum, iii. 86.
—— robustissimum, iii. 86.
—— *rubrum*, iii. 85, 86.
—— squamigerum, iii. 86.
—— *squamigerum*, iv. 293.
—— tomentosum, iii. 86.
—— trinervium, iii. 86.
—— velutinum, iii. 87.
PHOTINIA, i. 380.
Photinia mexicana, i. 380.
PHRAGMITES, iii. 571.
Phragmites berlandieri, iii. 571.
—— communis, iii. 571.
—— *communis*, iii. 572.
—— *martinicensis*, iii. 572.
Phrynium warscewiczii, iii. 310.
Phygelius, iv. 257.
PHYLLACTIS, ii. 67.
Phyllactis mexicana, ii. 67.
—— pratensis, ii. 67.
—— *pratensis*, ii. 68.
PHYLLANTHUS, iii. 102.
Phyllanthus, iv. 147.
Phyllanthus acuminatus, iii. 102.
—— adenodiscus, iii. 103.
—— carolinensis, iii. 103.
—— *carolinensis*, iv. 233.

Phyllanthus chlorophæus, iii. 103.
—— commutatus, iii. 104.
—— compressus, iii. 103.
—— diffusus, iii. 103.
—— ericoides, iii. 103.
—— galeottianus, iii. 103.
—— genuinus, iii. 103, 104.
—— glaucescens, iii. 103.
—— grandifolius, iii. 103.
—— *hoffmannseggii*, iii. 103.
—— lathyroides, iii. 104.
—— laxiflorus, iii. 104.
—— liebmannianus, iii. 104.
—— *lycioides*, iii. 102.
—— moçinianus, iii. 104.
—— *mucronatus*, iii. 102.
—— neurocarpus, iii. 104.
—— niruri, iii. 104; iv. 114.
—— *nutans*, iv. 108.
—— *oxycladus*, iii. 104.
—— pavonianus, iii. 104.
—— polygonoides, iii. 104; iv. 86.
—— *ruscoides*, iii. 102.
PHYLLOCACTUS, i. 547.
Phyllocactus ackermanni, i. 547.
—— anguliger, i. 547.
—— biformis, i. 547.
—— crenatus, i. 548.
—— grandis, i. 548.
—— latifrons, i. 548.
—— phyllanthoides, i. 548.
—— phyllanthus, i. 548.
—— serratus, i. 548.
Phylloglossum, iii. 700; iv. 282.
PHYLLONOMA, i. 385.
Phyllonoma, iv. 240.
Phyllonoma ruscifolia, i. 385.
Phymatodes angustus, iii. 654.
—— crassifolius, iii. 656.
—— *crispatus*, iii. 656.
—— lanceolatus, iii. 661.
—— *lepidotum*, iii. 661.
—— lycopodioides, iii. 663.
—— percussum, iii. 665.
PHYSALIS, ii. 418.
Physalis, iv. 149, 256.
Physalis æquata, ii. 418.
—— angulata, ii. 418.
—— *angulata*, ii. 421.
—— *arborescens*, ii. 423, 424.
—— capsicifolia, ii. 418.
—— *cardiophylla*, ii. 418.
—— chenopodiifolia, ii. 418.
—— cordata, ii. 418.
—— coztomatl, ii. 418.
—— crassifolia, ii. 418.
—— curassavica, ii. 418.
Physalis dentata, ii. 418.
—— divaricata, ii. 418.
—— *edulis*, iv. 75.
—— fendleri, iv. 75.
—— fœtens, ii. 419.
—— *fœtidissima*, ii. 419.
—— geniculata, ii. 419.
—— glabra, ii. 419.
—— glutinosa, ii. 419.
—— gracilis, ii. 419.
—— hederæfolia, ii. 419.
—— hirsuta, ii. 419.
—— *hirsuta*, iv. 291.
—— lævigata, ii. 419.
—— lanceifolia, ii. 419.
—— lanceolata, ii. 420.
—— *linkiana*, ii. 418.
—— lobata, iv. 75.
—— minima, ii. 420.
—— minutiflora, ii. 420.
—— mollis, ii. 420.
—— nicandroides, ii. 420.
—— orizabæ, ii. 420.
—— pedunculata, ii. 420.
—— peruviana, ii. 420; iv. 75.
—— philadelphica, iv. 75.
—— pubescens, ii. 420.
—— sancti-josephi, ii. 420.
—— schiedeana, ii. 421.
—— villosa, ii. 421.
—— *violacea*, iv. 75.
—— xalapensis, ii. 422.
Physematium molle, iii. 595.
PHYSODIUM, i. 130.
Physodium corymbosum, i. 130.
—— dubium, i. 130.
PHYSOSIPHON, iii. 204.
Physosiphon carinatus, iii. 204.
—— *carinatus*, iv. 303.
—— loddigesii, iii. 204.
—— *nicaraguensis*, iii. 200.
—— ochraceus, iii. 204.
—— *ochraceus*, iv. 302.
PHYSOSTEGIA, ii. 570.
Physostegia imbricata, ii. 570.
—— virginiana, ii. 570.
Physostemon mexicana, i. 41.
PHYSURUS, iii. 303.
Physurus, iv. 229, 268.
—— *brachyceras*, iii. 303; iv. 302.
—— calophyllus, iii. 303.
—— claviger, iii. 303.
—— loxoglottis, iii. 303.
—— tridax, iii. 303.
—— vaginatus, iii. 303.
—— vesicifer, iii. 303.
PHYTOLACCA, iii. 29.
Phytolacca, iv. 259.
—— *decandra*, iii. 29, 30.
—— icosandra, iii. 29.
—— *icosandra*, iv. 83.
—— *longispica*, iii. 30.
—— *mexicana*, iii. 29; iv. 83.
—— octandra, iii. 30.
—— *purpurascens*, iii. 29.
—— *rugosa*, iii. 30.
Phytolaccacea, i. 22.
PHYTOLACCACEÆ, iii. 28; iv. 83, 107.
Phytolaccaceæ, iv. 190, 204, 215, 217, 225, 259.
Picea glaucescens, iii. 190.
—— *hirtella*, iii. 190.
—— *religiosa*, iii. 190.
PICRAMNIA, i. 174.
Picramnia andicola, i. 174.
—— antidesma, i. 174; iv. 98.
—— bonplandiana, i. 174.
—— *bonplandiana*, i. 175.
—— carpenteriæ, i. 174.
—— ciliata, i. 175.
—— fessonia, i. 175.
—— *filipetala*, i. 215.
—— lindeniana, i. 175.
—— longissima, i. 175.
—— nervosa, i. 174.
—— *pendula*, i. 175.
—— polyantha, i. 175.
—— *seemaniana*, iv. 167.
—— teapensis, i. 175.
—— tetramera, i. 175.
—— umbrosa, i. 175.
—— xalapensis, i. 175.
PICRAMNIEÆ, i. 174.
PICRELLA, i. 174.
Picrella trifoliata, i. 174.
PICTETIA, i. 269.
Pictetia microphylla, i. 269.
Pieris mexicana, ii. 282.
PILEA, iii. 156.
Pilea acuminata, iii. 156.
—— auriculata, iii. 156.
—— *callitrichioides*, iii. 158.
—— deltoidea, iii. 156.
—— falcata, iii. 156.
—— fuscata, iii. 157.
—— herniarioides, iii. 157.
—— hyalina, iii. 156.
—— integrifolia, iii. 156.
—— longifolia, iii. 157.
—— longipes, iii. 156.
—— lundii, iii. 157.
—— mexicana, iii. 157.
—— microphylla, iii. 157.

Pilea muscosa, iii. 157.
—— nana, iii. 157.
—— *peperomiæfolia*, iii. 157.
—— *peplidifolia*, iii. 158.
—— *portula*, iii. 157.
—— *portulacina*, iii. 157.
—— portulacoides, iii. 157.
—— pubescens, iii. 157.
—— rhexioides, iii. 157.
—— rubiæfolia, iii. 158.
—— rupicola, iii. 157.
—— scrobiculata, iii. 158.
—— *serpyllacea*, iii. 158.
—— serpyllifolia, iii. 158.
—— trianthemoides, iii. 158.
—— trichotoma, iii. 158.
—— vulcanica, iii. 158.
—— *vulcanica*, iv. 293.
—— *xalapensis*, iii. 157.
Pileostegia mexicana, i. 187.
Pilinophytum, iii. 110.
—— *capitatum*, iii. 110.
Pilocereus chrysomallus, i. 541.
—— *columna*, i. 541.
—— *polylophus*, i. 545.
—— *senilis*, i. 546.
Pilostyles thurberi, iii. 41.
Pilularia, iii. 709; iv. 282.
PIMENTA, i. 409.
Pimenta cumanensis, i. 409.
—— longifolia, i. 409.
—— officinalis, i. 409.
—— *officinalis*, iv. 147.
—— ovalifolia, i. 409.
—— tabasco, i. 409.
—— tenuifolia, i. 409.
Pimpinella, iv. 149.
PINAROPAPPUS, ii. 262.
Pinaropappus roseus, ii. 262.
PINGUICULA, ii. 470.
Pinguicula, iv. 149.
Pinguicula acuminata, ii. 470.
—— *bakeriana*, ii. 471.
—— caudata, ii. 471.
—— *caudata*, iv. 292.
—— *cordata*, iv. 79.
—— crenatiloba, ii. 471.
—— *flos-mulionis*, ii. 471.
—— heterophylla, ii. 471.
—— *heterophylla*, iv. 292.
—— lilacina, ii. 471.
—— *macrophylla*, ii. 471.
—— *moranensis*, ii. 471.
—— *nana*, ii. 471.
—— *oblongiloba*, ii. 471.
—— *obtusiloba*, ii. 471.
—— *orchidioides*, ii. 471.
Pinguicula sodalium, iv. 79.
PINUS, iii. 186.
Pinus, iv. 127, 155, 265, 302, 303, 314.
—— *aculcensis*, iii. 187.
—— *amecanensis*, iii. 187.
—— *angulata*, iii. 188.
—— arizonica, iii. 186.
—— *atrovirens*, iii. 187.
—— ayacahuite, iii. 186.
—— *ayacahuite*, iv. 88, 294.
—— *aztecanensis*, iii. 188.
—— *backhousiana*, iii. 188.
—— *besseriana*, iii. 189.
—— *boothiana*, iii. 188.
—— *boucheana*, iii. 188.
—— *bullata*, iii. 188.
—— *buonapartea*, iii. 186.
—— *cedrus*, iii. 187.
—— cembroides, iii. 186.
—— *cembroides*, iv. 294.
—— chihuahuana, iii. 186.
—— *chihuahuana*, iv. 142.
—— *coarctata*, iii. 188.
—— *colorado*, iii. 186.
—— *comonfortii*, iii. 187.
—— *cornea*, iii. 188.
—— *corrugata*, iii. 187.
—— *cubensis*, iv. 151, 266.
—— *decaisneana*, iii. 188.
—— *decandolleana*, iii. 187.
—— *dependens*, iii. 187.
—— *devoniana*, iii. 188.
—— *dolleriana*, iii. 188.
—— *don pedri*, iii. 186.
—— *douglasii*, iii. 190.
—— *durangensis*, iii. 186.
—— edulis, iii. 186.
—— *edulis*, iv. 141.
—— *ehrenbergii*, iii. 187.
—— *elegans*, iii. 188.
—— *endlicheriana*, iii. 187.
—— engelmanni, iii. 187.
—— *engelmannii*, iii. 189.
—— *escandoniana*, iii. 189.
—— *fertilis*, iii. 186.
—— filifolia, iii. 187.
—— flexilis, iii. 187.
—— *fremontiana*, iii. 186.
—— *frondosa*, iii. 187.
—— *galacote*, iii. 189.
—— *geitneri*, iii. 187.
—— *gordoniana*, iii. 188.
—— *gracilis*, iii. 187.
—— *grandis*, iii. 188.
—— greggii, iii. 187.
—— *grenvilleæ*, iii. 188.
—— *haageana*, iii. 188.
Pinus hamata, iii. 186.
—— *hartwegii*, iii. 187; iv. 266, 294.
—— hartwegii, iii. 187.
—— *hendersonii*, iii. 188.
—— *heteromorpha*, iii. 189.
—— *horizontalis*, iii. 188.
—— *hoseriana*, iii. 189.
—— *hügelii*, iii. 189.
—— *huisquilucanensis*, iii. 187.
—— *inflexa*, iii. 188.
—— *interposita*, iii. 189.
—— iztacihuatli, iii. 187.
—— *josti*, iii. 187.
—— *keteleerii*, iii. 188.
—— *krelagi*, iii. 187.
—— lambertiana, iii. 187.
—— latisquama, iv. 88.
—— lawsoni, iii. 187.
—— leiophylla, iii. 187.
—— *leiophylla*, iv. 148, 294.
—— *leroyi*, iii. 188.
—— lindleyana, iii. 188.
—— *llaveana*, iii. 186.
—— *longifolia*, iii. 187.
—— *loudoniana*, iii. 186.
—— *lowii*, iii. 187.
—— macrophylla, iii. 188.
—— *macrophylla*, iii. 187.
—— *magnifica*, iii. 188.
—— *michoacaensis*, iii. 188.
—— *microcarpa*, iii. 189.
—— *monstrosa*, iii. 188.
—— *monteallegri*, iii. 187.
—— *montezumæ*, iii. 187, 188; iv. 148, 150, 164, 266, 294.
—— *mülleriana*, iii. 189.
—— *neplusultra*, iii. 188.
—— *nesselrodiana*, iii. 188.
—— *nitida*, iii. 188.
—— *northumberlandiana*, iii. 188.
—— *ocampii*, iii. 188.
—— *occidentalis*, iii. 188; iv. 164, 266.
—— *ocote*, iii. 188.
—— oocarpa, iii. 188.
—— *oocarpa*, iv. 266, 294.
—— *orizabæ*, iii. 189.
—— *ortgiesiana*, iii. 188.
—— *osteosperma*, iii. 186.
—— *papelui*, iii. 187.
—— patula, iii. 189.
—— *patula*, iv. 266, 294.
—— *pawlikowskiana*, iii. 188.
—— *paxtoni*, iii. 188.
—— pinceana, iii. 189.
—— *pinceana*, iv. 294.
—— *planchoni*, iii. 188.

Pinus ponderosa, iii. 189.
—— *popocatepetlii*, iii. 186.
—— *prasina*, iii. 189.
—— *protuberans*, iii. 189.
—— *pseudostrobus*, iii. 188.
—— pseudostrobus, iii. 189.
—— *regeliana*, iii. 189.
—— *religiosa*, iii. 190.
—— *resinosa*, iii. 187.
—— *retracta*, iii. 188.
—— *richardiana*, iii. 188.
—— *rinzii*, iii. 188.
—— *robusta*, iii. 187.
—— *rubescens*, iii. 188.
—— *rudis*, iii. 187.
—— *rumeliana*, iii. 188.
—— *russelliana*, iii. 188.
—— *sanrafaeliana*, iii. 188.
—— *scoparia*, iii. 187.
—— *skinneri*, iii. 187.
—— *soulangeana*, iii. 188.
—— *spinosa*, iii. 188.
—— *standishii*, iii. 187.
—— *strobiformis*, iii. 186.
—— *subpatula*, iii. 189.
—— *suffruticosa*, iii. 187.
—— *tanangensis*, iii. 188.
—— tenuifolia, iii. 189.
—— *tenuifolia*, iv. 266.
—— teocote, iii. 189.
—— *thelemanni*, iii. 188.
—— *thibaudiana*, iii. 188.
—— *tlamacaensis*, iii. 187.
—— *tomacocaensis*, iii. 188.
—— *troubezkoiana*, iii. 188.
—— *tzompoliana*, iii. 189.
—— *valida*, iii. 188.
—— *van geertii*, iii. 188.
—— *van houttei*, iii. 188.
—— *veitchii*, iii. 186.
—— *verrucosa*, iii. 187.
—— *verschaffeltii*, iii. 188.
—— *vilmorinii*, iii. 189.
—— *wilsoni*, iii. 188.
—— *wincestriana*, iii. 188.
—— *zacatlanæ*, iii. 188.
—— *zitacuaria*, iii. 188.
Pionandra allophylla, ii. 417.
—— *hartwegii*, ii. 417.
—— *tegorea*, ii. 417.
PIPER, iii. 45.
Piper, iv. 148, 149, 212, 259.
Piper aduncum, iii. 45.
—— *affine*, iii. 64.
—— amplifolium, iii. 46.
—— angustifolium, iii. 45.
—— artanthopse, iii. 45.
Piper asarifolium, iii. 58.
—— auritum, iii. 45.
—— begoniæfolium, iii. 46.
—— berteroanum, iii. 46.
—— *blandum*, iii. 58.
—— bourgeaui, iii. 46.
—— bredemeyeri, iii. 46.
—— *bredemeyeri*, iv. 114.
—— caladiifolium, iii. 46.
—— candelarianum, iii. 46.
—— cardiophyllum, iii. 46.
—— cartagoanum, iii. 46.
—— casimirianum, iii. 46.
—— ceanothifolium, iii. 47.
—— chamissonis, iii. 47.
—— chinantlense, iii. 47.
—— colipanum, iii. 47.
—— *commutatum*, iii. 53.
—— connivens, iii. 51.
—— cordillerianum, iii. 47.
—— cordovanum, iii. 47.
—— cordulatum, iii. 47.
—— costaricense, iii. 47.
—— crassispicatum, iii. 47.
—— crassum, iii. 54.
—— cuernavacanum, iii. 47.
—— cumingianum, iii. 53.
—— darienense, iii. 48.
—— decipiens, iii. 48.
—— decrescens, iii. 48.
—— decurrens, iii. 48.
—— *deppeanum*, iii. 60.
—— descourtilsianum, iii. 48.
—— diandrum, iii. 48.
—— dilatatum, iii. 48.
—— disjunctum, iii. 48.
—— *distachyon*, iii. 60.
—— ellipticum, iii. 48.
—— epigynium, iii. 48.
—— fischerianum, iii. 49.
—— friedrichsthalii, iii. 49.
—— *galeottianum*, iii. 60.
—— *glaucescens*, iii. 57.
—— globosum, iii. 49.
—— grandifolium, iii. 49.
—— *granulosum*, iii. 45.
—— guanacastense, iii. 49.
—— hirsutum, iii. 49.
—— *hispidulum*, iii. 61.
—— *hispidum*, iii. 51.
—— irazuanum, iii. 49.
—— jalapense, iii. 49.
—— *jalapense*, iii. 50.
—— karwinskianum, iii. 49.
—— kunthii, iii. 49.
—— lapathifolium, iii. 50.
—— ledebourii, iii. 50.
Piper lepturum, iii. 50.
—— *leucophyllum*, iii. 57.
—— liebmannii, iii. 50.
—— lindenii, iii. 50.
—— linearifolium, iii. 50.
—— lineatum, iii. 50.
—— lucæanum, iii. 50.
—— macrophyllum, iii. 50.
—— magnifolium, iii. 54.
—— *magnoliæfolium*, iii. 62.
—— marginatum, iii. 50
—— martensianum, iii. 51.
—— medium, iii. 51.
—— megalophyllum, iii. 51.
—— melanostictum, iii. 51.
—— melastomoides, iii. 51.
—— mexicanum, iii. 51.
—— micranthera, iii. 51.
—— minus, iii. 56.
—— miradorense, iii. 51.
—— misantlense, iii. 51.
—— mollicomum, iii. 52.
—— muelleri, iii. 52.
—— multinervium, iii. 52.
—— naranjoanum, iii. 52.
—— neesianum, iii. 52.
—— nervosum, iii. 52.
—— nitidulum, ii. 52.
—— novæ-hispaniæ, iii. 52.
—— nudum, iii. 52.
—— *nutans*, iii. 56.
—— oaxacanum, iii. 52.
—— obliquum, iii. 52.
—— oblongum, iii. 52.
—— *oblongum*, iii. 47.
—— œrstedii, iii. 53.
—— ottonis, iii. 53.
—— ovatum, iii. 48.
—— pachystachyon, iii. 53.
—— panamense, iii. 53.
—— papantlense, iii. 53.
—— *parvulum*, iii. 62.
—— *patens*, iii. 52.
—— *patulum*, iii. 51.
—— *pellucidum*, iii. 63.
—— peltatum, iii. 53.
—— persicariæfolium, iii. 53.
—— pilosiusculum, iii. 53.
—— plantagineum, iii. 53.
—— platyphyllum, iii. 53.
—— *populifolium*, iii. 46.
—— pothomorphe, iii. 54.
—— prismaticum, iii. 54.
—— pseudoasperifolium, iii. 54.
—— pseudofuligineum, iii. 54.
—— pseudolindenii, iii. 54.
—— pseudopropinquum, iii. 54.

Piper pyrifolium, iii. 57.
—— realejoanum, iii. 54.
—— *reflexum*, iii. 64.
—— reticulatum, iii. 54.
—— reticulosum, iii. 54.
—— rohrii, iii. 54.
—— *rotundifolium*, iii. 59.
—— ruizianum, iii. 54.
—— salicinum, iii. 54.
—— sanctum, iii. 55.
—— sanjoseanum, iii. 55.
—— scabrifolium, iii. 55.
—— *scandens*, iii. 65.
—— schiedeanum, iii. 45.
—— schlechtendalianum, iii. 55.
—— septuplinervium, iii. 55.
—— smilacifolium, iii. 55.
—— sororium, iii. 55.
—— stipulaceum, iii. 55.
—— striatum, iii. 55.
—— subfuscum, iii. 55.
—— teapense, iii. 55.
—— tenuifolium, iii. 56.
—— *terminale*, iii. 57.
—— tigerianum, iii. 56.
—— *tiliæfolium*, iii. 57.
—— trinerve, iii. 56.
—— triquetrum, iii. 56.
—— tuberculatum, iii. 56.
—— turrialvanum, iii. 56.
—— uhdei, iii. 56.
—— umbellatum, iii. 56.
—— unguiculatum, iii. 56.
—— urostachyum, iii. 57.
—— variifolium, iii. 57.
—— veraguense, iii. 57.
—— verbascifolium. iii. 57.
—— verruculosum, ii. 57.
—— wagneri, iii. 57.
—— yucatanense, iii. 57.
—— zacuapanum, iii. 57.
PIPERACEÆ, iii. 44; iv. 84.
Piperaceæ, iv. 191, 202, 217, 229, 231, 259.
PIPTADENIA, i. 343.
Piptadenia fœtida, i. 343.
—— patens, i. 343; iv. 32.
Piptatherum acuminatum, iii. 484.
PIPTOCARPHA, ii. 75.
Piptocarpha chontalensis, ii. 75.
Piptolepis phillyreoides, ii. 305.
PIQUERIA, ii. 77.
Piqueria pilosa, ii. 77.
—— serrata, ii. 77.
—— triflora, ii. 77.
—— trinervia, ii. 78.
—— *trinervia*, ii. 77.
Pirigara insignis, i. 413.
—— *speciosa*, i. 413.
Piriqueta, iv. 230, 244.
—— *cistoides*, i. 474; iv. 39.
—— *odorata*, iv. 39.
Pironneava spectabilis, iii. 315.
PISCIDIA, i. 319.
Piscidia erythrina, i. 319; iv. 99, 112.
PISONIA, iii. 8.
Pisonia, iv. 258.
Pisonia aculeata, iii. 8.
—— hirtella, iii. 9.
—— *mexicana*, iii. 9.
—— pacurero, iii. 9.
PISTACIA, i. 221.
Pistacia mexicana, i. 221; iv. 25.
PISTIA, iii. 417.
Pistia obcordata, iii. 417.
—— *occidentalis*, iii. 417.
—— *schleideniana*, iii. 417.
—— *spathulata*, iii. 417.
—— stratiotes, iii. 417.
—— *texensis*, iii. 417.
PITCAIRNIA, iii. 315.
Pitcairnia albiflos, iii. 315.
—— *asterotricha*, iii. 315.
—— atrorubens, iii. 315.
—— *cernua*, iii. 316.
—— echinata, iii. 315.
—— elata, iii. 315.
—— *exscapa*, iii. 316.
—— ferruginea, iii. 315.
—— fulgens, iii. 316.
—— gireoudiana, iii. 316.
—— heterophylla, iii. 316.
—— imbricata, iii. 316.
—— jacksoni, iii. 316.
—— karwinskiana, iii. 316.
—— montalbensis, iii. 316.
—— moritziana, iii. 316.
—— *morrenii*, iii. 316.
—— ochroleuca, iii. 317.
—— odorata, iii. 317.
—— petiolata, iii. 317.
—— punicea, iii. 317.
—— *ringens*, iii. 316.
—— *splendens*, iii. 316.
—— tabulæformis, iii. 317.
—— vallisoletana, iii. 317.
—— zeifolia, iii. 317.
PITHECOCTENIUM, ii. 493.
Pithecoctenium aubletii, ii. 493.
—— *buccinatorium*, ii. 490.
—— cinereum, ii. 493.
—— hexagonum, ii. 493.
—— laxiflorum, ii. 493.
Pithecoctenium muricatum, ii. 493.
—— *panamense*, ii. 493.
PITHECOLOBIUM, i. 359.
Pithecolobium, iv. 161.
Pithecolobium acatlense, i. 359.
—— albicans, i. 359.
—— bertolonii, i. 359.
—— brevifolium, i. 359.
—— cognatum, i. 359.
—— dulce, i. 359.
—— elachistophyllum, iv. 33.
—— filicifolium, i. 360.
—— fragrans, i. 360.
—— furcatum, i. 360.
—— hymeneæfolium, i. 360.
—— *lanceolatum*, i. 360.
—— latifolium, i. 360.
—— ligustrinum, i. 360.
—— *macrostachyum*, i. 360.
—— multiflorum, i. 360.
—— oblongum, i. 360; iv. 112.
—— palmeri, i. 360; iv. 33.
—— *panamense*, i. 360.
—— parvifolium, i. 361.
—— saman, i. 361.
—— schaffneri, iv. 33.
—— sericiflorum, iv. 99.
—— sophorocarpum, i. 361.
—— unguis-cati, iv. 112.
Pittoniotis protracta, ii. 42.
—— *trichantha*, ii. 42.
Pittosporeæ, iv. 173.
Pityrophyllum, iii. 319.
PLACOCARPA, ii. 45.
Placocarpa mexicana, ii. 45.
Plagiogyria æquidentata, iii. 627.
—— *biserrata*, iii. 627.
—— costaricensis, iii. 626.
—— semicordata, iii. 627.
Plagiophyllum grandiflorum, i. 415.
—— *parvifolium*, i. 415.
Planarium latisiliquum, i. 268.
PLANTAGINEÆ, ii. 574; iv. 81, 107.
Plantagineæ, iv. 189, 204, 225.
PLANTAGO, ii. 574.
Plantago, iii. 700.
Plantago aristata, ii. 575.
—— bernoulliana, ii. 575; iv. 81.
—— caulescens, iv. 82.
—— cumingiana, ii. 575.
—— floccosa, ii. 575.
—— galeottiana, ii. 575.
—— *galeottiana*, iv. 293.
—— hirtella, ii. 575.
—— major, ii. 575; iv. 107
—— mexicana, ii. 575.

Plantago mexicana, iv. 149.
—— multiceps, ii. 575.
—— nivea, ii. 575.
—— *patagonica*, ii. 575.
—— philippica, ii. 576.
—— schiedeana, ii. 576.
—— virginica, ii. 576.
—— xorullensis, ii. 576.
PLATANACEÆ, iii. 161; iv. 87.
Platanaceæ, iv. 193, 205, 226.
Platanthera foliosa, iii. 306.
—— *ghiesbreghtiana*, iii. 305.
—— *leucostachys*, iii. 305.
—— *limosa*, iii. 305.
—— *longifolia*, iv. 90, 305.
—— *nubigena*, iv. 90, 305.
—— *propinqua*, iv. 303.
—— *vulcanica*, iii. 306.
PLATANUS, iii. 161.
Platanus lindeniana, iii. 162; iv. 87.
—— mexicana, iii. 162.
—— *mexicana*, iv. 87, 146.
—— racemosa, iii. 162.
—— *racemosa*, iv. 87.
—— wrightii, iii. 162.
Plateilema palmeri, iv. 63.
Platycerium, iii. 683.
Platychila tridentata, ii. 513.
Platyloma andromedæfolium, iii. 618.
—— cordatum, iii. 619.
PLATYMISCIUM, i. 317.
Platymiscium parviflorum, i. 317.
—— polystachyum, i. 317.
—— trifoliatum, i. 317.
PLATYPODIUM, i. 316.
Platypodium elegans, i. 316.
Platypteris crocata, ii. 187.
—— fraseri, ii. 187.
Platystachya, iii. 319.
Platystachys bulbosa, iii. 319.
—— *complanata*, iii. 320.
—— *cyanea*, iii. 320.
—— *ehrenbergiana*, iii. 320.
—— *kunthiana*, iii. 321.
Platyzamia, iii. 191.
—— *rigida*, iii. 191.
Platyzoma, iii. 589.
Plecosorus mexicanus, iii. 616.
—— *peruvianus*, iii. 616.
Plectocephalus americanus, ii. 253.
Plectopoma fimbriatum, ii. 473.
—— *glabratum*, ii. 473.
—— *gloxiniflorum*, ii. 473.
Pleopeltis angusta, iii. 654.
—— *astrolepis*, iii. 677.
—— *crassinervata*, iii. 661.
Pleopeltis elongata, iii. 677.
—— *lepidota*, iii. 661.
—— *lycopodioides*, iii. 663.
—— *polylepis*, iii. 661.
—— *squamulosa*, iii. 663.
Pleopogon, iii. 554.
PLEROMA, i. 418.
Pleroma, iv. 150, 243, 299.
Pleroma bipenicillatum, i. 418.
—— galeottianum, i. 418.
—— longifolium, i. 418.
—— *longifolium*, iv. 242, 285.
—— mexicanum, i. 419.
—— naudinianum, i. 419.
—— scabriusculum, i. 419.
—— schiedeanum, i. 419.
—— *schiedeanum*, iv. 242, 285.
PLEURANTHIUM, iii. 221.
Pleuridium angustum, iii. 654.
—— *crassifolium*, iii. 656.
Pleurogramme graminifolia, iii. 676.
—— immersa, iii. 675.
—— myrtillifolia, iii. 675.
—— seminuda, iii. 676.
PLEUROPETALUM, iii. 11.
Pleuropetalum, iii. 12; iv. 233.
Pleuropetalum costaricense, iii. 12.
PLEUROTHALLIS, iii. 197.
Pleurothallis, iv. 153, 213, 271.
—— *alata*, iii. 198.
—— amœna, iii. 197.
—— angustifolia, iii. 197.
—— *atropurpurea*, iii. 207.
—— *aurea*, iii. 198; iv. 304.
—— *bicolor*, iii. 202.
—— bilamellata, iii. 198.
—— breviflora, iii. 198.
—— cardiothallis, iii. 198.
—— caulescens, iii. 198.
—— chrysantha, iii. 198.
—— circumplexa, iii. 198.
—— *coccinea*, iii. 271.
—— cochlearis, iii. 198.
—— conanthera, iii. 198.
—— *congesta*, iii. 200.
—— corniculata, iii. 198.
—— *crassifolia*, iii. 200.
—— crenata, iii. 198.
—— disticha, iii. 199.
—— dubia, iii. 199.
—— endotrachys, iii. 199.
—— *fallax*, iii. 202.
—— fuegi, iii. 199.
—— fulgens, iii. 199.
—— *ghiesbreghtiana*, iii. 201.
—— incompta, iii. 199.
—— krameriana, iii. 199.
Pleurothallis lateritia, iii. 199.
—— *lepanthiformis*, iii. 202.
—— leucopyramis, iii. 199.
—— linearis, iii. 199.
—— longissima, iii. 199.
—— luctuosa, iii. 199.
—— marginata, iii. 200.
—— *mesophylla*, iii. 198; iv. 304
—— microphylla, iii. 200.
—— *microphylla*, iv. 301.
—— *minax*, iii. 201.
—— minutalis, iii. 200.
—— moschata, iii. 200.
—— *multicaulis*, iii. 201
—— *muscifera*, iii. 206.
—— naraniensis, iii. 200.
—— nicaraguensis, iii. 200.
—— *nubigena*, iii. 198.
—— *obscura*, iii. 198.
—— octomerioides, iii. 200.
—— *ophiocephala*, iii. 206.
—— pachyglossa, iii. 200.
—— pantasmi, iii. 200.
—— perpusilla, iii. 200.
—— phyllocardia, iii. 200.
—— *picta*, iii. 202.
—— plumosa, iii. 201.
—— polyliria, iii. 201.
—— polystachya, iii. 201.
—— *puberula*, iii. 206.
—— pubescens, iii. 201.
—— pyrsodes, iii. 201.
—— quadrifida, iii. 201.
—— *racemiflora*, iii. 199.
—— retusa, iii. 201.
—— rufo-brunnea, iii. 201
—— ruscifolia, iii. 201.
—— *ruscifolia*, iii. 270.
—— scariosa, iii. 201.
—— schiedei, iii. 201.
—— segoviensis, iii. 202.
—— *spathulata*, iii. 202.
—— stenostachya, iii. 202.
—— strupifolia, iii. 202.
—— *succosa*, iii. 201.
—— tenuissima, iii. 202.
—— tribuloides, iii. 202.
—— trichopoda, iii. 202.
—— *ujarensis*, iii. 206.
—— vilipensa, iii. 202.
—— villosa, iii. 202.
—— violacea, iii. 202.
—— *violacea*, iv. 305.
—— vittata, iii. 203.
—— *wagneriana*, iii. 203.
PLOCOSPERMA, ii. 338.
Plocosperma buxifolium, ii. 338.

PLUCHEA, ii. 133.
Pluchea auriculata, ii. 133.
—— *borealis*, iv. 141.
—— camphorata, iv. 53.
—— cortesii, ii. 133.
—— *floribunda*, ii. 130.
—— odorata, ii. 133; iv. 54, 112.
—— purpurascens, ii. 133; iv. 103.
—— subdecurrens, ii. 133.
—— ——, var. canescens, iv. 54.
PLUKENETIA, iii. 131.
Plukenetia penninervia, iii. 131.
PLUMBAGINEÆ, ii. 286; iv. 67.
Plumbagineæ, iv. 185, 205.
PLUMBAGO, ii. 287.
Plumbago mexicana, ii. 287.
—— pulchella, ii. 287; iv. 67.
—— *rhomboidea*, ii. 287.
—— scandens, ii. 287.
—— *scandens*, iv. 67.
PLUMERIA, ii. 308.
Plumeria acuminata, ii. 308.
—— acutifolia, ii. 308.
—— *gouani*, ii. 308.
—— lambertiana, ii. 308.
—— megaphylla, ii. 309.
—— *mexicana*, ii. 308.
—— mollis, ii. 309.
—— rubra, ii. 309.
—— xanthostoma, ii. 309.
Pneumonanthe bicuspidata, ii. 349.
POA, iii. 579.
Poa, iii. 567; iv. 149.
Poa acutiflora, iii. 572.
—— annua, iii. 579.
—— *annua*, iii. 580; iv. 150.
—— bourgæi, iii. 580.
—— *capillaris*, iii. 573.
—— *ciliaris*, iii. 573.
—— *condensata*, iii. 578.
—— conglomerata, iii. 580.
—— *conglomerata*, iv. 297, 305.
—— depauperata, iii. 580.
—— *eragrostis*, iii. 575.
—— *hænkei*, iii. 572.
—— *hirsuta*, iii. 574.
—— *hypnoides*, iii. 576.
—— infirma, iii. 580.
—— *infirma*, iv. 297.
—— *interrupta*, iii. 574.
—— *maypurensis*, iii. 574.
—— *megastachya*, iii. 575.
—— *mexicana*, iii. 574.
—— *montufari*, iii. 574.
—— *oxylepis*, iii. 574.
—— *panicoides*, iii. 574.
Poa patula, iii. 574.
—— *pauciflora*, iii. 580.
—— *pectinacea*, iii. 575.
—— *polymorpha*, iii. 574.
—— *preslei*, iii. 579.
—— *prostrata*, iii. 578.
—— *rariflora*, iii. 576.
—— *reptans*, iii. 576.
—— ruprechtii, iii. 580.
—— *subumbellata*, iii. 576.
—— subuniflora, iii. 580.
—— *thalassica*, iii. 579.
POACEÆ, iii. 531.
Poaceæ, iv. 199.
PODACHÆNIUM, ii. 192.
Podachænium paniculatum, ii. 192.
Podocarpeæ, iii. 185.
Podocarpus, iii. 185; iv. 156, 265, 314.
PODOPTERUS, iii. 37.
Podopterus, iv. 259.
Podopterus mexicanus, iii. 38.
Podosæmum brachyphyllum, iii. 552.
—— *ciliatum*, iii. 539.
—— *debile*, iii. 540.
—— *distichophyllum*, iii. 540.
—— *glabratum*, iii. 541.
—— *glaucum*, iii. 539, 551.
—— *gracile*, iii. 541.
—— *implicatum*, iii. 541.
—— *mexicanum*, iii. 551.
—— *mucronatum*, iii. 541.
—— *quadridentatum*, iii. 541.
—— *rigidum*, iii. 542.
—— *setosum*, iii. 540.
—— *stipoides*, iii. 535, 542.
—— *strictum*, iii. 542.
—— *tenellum*, iii. 542.
—— *tenuifolium*, iii. 343.
—— *tenuissimum*, iii. 543.
—— *virescens*, iii. 543.
—— *virginicum*, iii. 548.
PODOSTEMACEÆ, iii. 38.
Podostemaceæ, iv. 191, 204, 217, 231.
PŒPPIGIA, i. 323.
Pœppigia procera, i. 323.
Pogonatherum crinitum, iv. 94.
POGONIA, iii. 304.
Pogonia rosea, iii. 304.
Pogonopsis scabra, iii. 588.
—— tenera, iii. 588.
—— *tenera*, iii. 560; iv. 94.
POGONOPUS, ii. 15.
Pogonopus exsertus, ii. 15.
Pogonorhynchus amplexans, i. 429.
Pogospermum, iii. 324.
Pogostoma saxifragæfolia, ii. 455.
Pohlia minor, iv. 150.
Poinciana coriaria, i. 324.
—— *pulcherrima*, i. 325.
Poinsettia cyathophora, iii. 95.
—— *dentata*, iii. 93.
—— *edwardsii*, iii. 95.
—— exclusa, iv. 85.
—— *frangulæfolia*, iii. 94.
—— *geniculata*, iii. 94.
—— *heterophylla*, iii. 95.
—— *lancifolia*, iii. 96.
—— *œrstediana*, iii. 98.
—— *pedunculata*, iii. 101.
—— *prunifolia*, iii. 94.
—— *pulcherrimum*, iii. 99; iv. 144.
—— *radians*, iii. 99.
—— *ruiziana*, iii. 94.
—— *schiedeana*, iii. 93.
—— *xalapensis*, iii. 102.
POIRETIA, i. 269.
Poiretia multiflora, i. 269.
—— scandens, i. 269.
Poivrea alternifolia, i. 403.
POLANISIA, i. 42.
Polanisia graveolens, i. 42.
—— trachysperma, i. 42; iv. 7.
—— uniglandulosa, i. 42.
POLEMONIACEÆ, ii. 353; iv. 71.
Polemoniaceæ, iv. 187, 203, 215, 217, 225, 229, 255.
POLEMONIUM, ii. 355.
Polemonium, iv. 150, 255.
Polemonium grandiflorum, ii. 355.
—— *grandiflorum*, iv. 291.
—— mexicanum, ii. 356.
POLIANTHES, iii. 337.
Polianthes gracilis, iii. 337.
—— *maculata*, iii. 337.
—— *mexicana*, iii. 337.
—— tuberosa, iii. 337.
POLIOMINTHA, ii. 549.
Poliomintha glabrescens, ii. 549.
—— incana, ii. 549.
—— longiflora, ii. 550.
—— marifolia, ii. 550.
—— mollis, ii. 550.
Polyactidium delphinifolium, ii. 124.
—— *seemannii*, ii. 120.
Polyalthia, i. 15.
Polyanthus, iii. 337.

POLYASTER, i. 170.
Polyaster boronoides, i. 170.
Polybæa crassifolia, ii. 273.
—— *laurifolia*, ii. 273.
Polybotrya caudata, iii. 684.
—— *cervina*, iii. 684.
POLYCARPÆA, i. 77.
Polycarpæa cuspidata, i. 77.
POLYCARPEÆ, i. 73.
Polyclathra cucumerina, i. 493.
POLYCYCNIS, iii. 263.
Polycycnis barbata, iii. 263.
—— gratiosa, iii. 263.
POLYGALA, i. 58.
Polygala, iv. 140.
—— *adenophylla*, i. 59.
—— alba, i. 58.
—— americana, i. 58.
—— *americana*, i. 61.
—— angustifolia, i. 58.
—— *aparinoides*, i. 59.
—— *asperuloides*, i. 59.
—— bicolor, i. 58.
—— boykinii, i. 58.
—— *boykinii*, iv. 283.
—— brizoides, i. 58.
—— buxifolia, i. 59.
—— calvipes, i. 59.
—— *camporum*, i. 58.
—— *caracasana*, i. 58.
—— conferta, i. 59.
—— cruciata, i. 59.
—— floribunda, i. 59.
—— galioides, i. 59.
—— glandulosa, i. 59.
—— glochidiata, i. 59.
—— gracilis, i. 60.
—— greggii, iv. 9.
—— hebantha, i. 60.
—— hemipterocarpa, i. 60.
—— hygrophila, i. 69.
—— inæquiloba, iv. 9.
—— incarnata, i. 60.
—— leptandroides, iv. 9.
—— leptocaulis, i. 60.
—— lindheimeri, i. 60.
—— *longicaulis*, i. 62; iv. 165.
—— macradenia, i. 60; iv. 9.
—— mexicana, i. 60.
—— *mexicana*, i. 62.
—— *microphylla*, i. 60.
—— *microptera*, i. 60.
—— minutiflora, i. 60.
—— *monticola*, i. 58.
—— nemoralis, i. 60.
—— *nemoralis*, iv. 9.
—— obscura, i. 60.
Polygala ovalifolia, i. 60.
—— *ovatifolia*, i. 60.
—— palmeri, iv. 9.
—— paniculata, i. 61.
—— parryi, i. 61.
—— parva, i. 59.
—— platycarpa, i. 61.
—— puberula, i. 61.
—— pubescens, i. 61.
—— pulchella, i. 61.
—— quadrangula, i. 61.
—— *rivinæfolia*, i. 58.
—— salviniana, i. 62.
—— scoparia, i. 62.
—— semialata, iv. 9.
—— *stellera*, i. 62.
—— strigulosa, i. 62.
—— *tenuis*, i. 60.
—— trichosperma, i. 62.
—— velutina, i. 62.
—— verticillata, 62.
—— viridis, iv. 9.
—— *wrightii*, i. 62.
Polygalaceæ, iv. 173, 203, 224.
POLYGALEÆ, i. 58; iv. 9.
POLYGONACEÆ, iii. 31; iv. 83, 107.
Polygonaceæ, iv. 190, 203, 215, 217, 225, 234, 259.
POLYGONATEÆ, iii. 367.
POLYGONUM, iii. 33.
Polygonum, iv. 259.
Polygonum acre, iii. 33.
—— acuminatum, iii. 33.
—— amphibium, iii. 34.
—— aviculare, iii. 34.
—— *flexuosum*, iii. 36.
—— glabrum, iii. 34.
—— *grandiflorum*, iii. 37.
—— hispidum, iii. 34.
—— hydropiperoides, iii. 34.
—— lapathifolium, iii. 34.
—— nodosum, iii. 34.
—— pennsylvanicum, iii. 34; iv. 83.
—— persicarioides, iii. 34.
—— *quadrangulatum*, iii. 36.
—— *scandens*, iii. 28.
—— segetum, iii. 35.
—— tenue, iii. 35.
—— *tenuifolium*, iii. 36.
—— *virgatum*, iii. 34.
—— *volcanicum*, iii. 36.
POLYMNIA, ii. 143.
Polymnia aspera, ii. 143.
—— maculata, ii. 143.
Polyodon distichum, iv. 95.
Polypetalæ, iv. 208, 209, 218, 219, 227.
POLYPODIACEÆ, iii. 591.
POLYPODIEÆ, iii. 653.
POLYPODIUM, iii. 653.
Polypodium, iv. 148, 149, 212, 281.
Polypodium adnatum, iii. 653.
—— *affine*, iii. 653.
—— alleopterum, iii. 654.
—— *alsophiloides*, iii. 652.
—— *amphostemon*, iii. 654.
—— angustifolium, iii. 654; iv. 116.
—— *angustifrons*, iii. 671.
—— angustum, iii. 654.
—— *angustum*, iii. 681.
—— *anisomeron*, iii. 657.
—— *apiculatum*, iii. 666.
—— *araneosum*, iii. 655.
—— *areolatum*, iii. 655.
—— arthropodium, iii. 654.
—— aspidiolepis, iv. 116.
—— *astrolepis*, iii. 677.
—— attenuatum, iii. 655.
—— aureum, iii. 655.
—— bernoullii, iii. 655.
—— *biserratum*, iii. 669, 670.
—— *cæsium*, iii. 594.
—— cæspitosum, iii. 655.
—— *callolepis*, iii. 663, 664.
—— *cancellatum*, iii. 658.
—— *catharinæ*, iii. 667.
—— catherinæ, iv. 116.
—— *cheilosticton*, iii. 666.
—— cheilosticton, iv. 116.
—— chnoodes, iii. 656 iv. 116.
—— ciliatum, iii. 672.
—— coarctatum, iii. 656.
—— *colpodes*, iii. 667.
—— *concinnum*, iii. 676.
—— *confluens*, iii. 667.
—— *consimile*, iii. 665.
—— *conterminans*, iii. 667.
—— *cordifolium*, iii. 643; iv. 300.
—— *coriaceum*, iii. 656.
—— *costatum*, iii. 666.
—— crassifolium, iii. 656; iv. 116.
—— crenatum, iii. 656.
—— *crenatum*, iii. 664.
—— *crispatum*, iii. 656.
—— *cryptocarpum*, iii. 659.
—— cultratum, iii. 656.
—— decumanum, iii. 656.
—— decussatum, iii. 656.
—— delicatulum, iii. 657.
—— *deltoideum*, iii. 667.

Polypodium dilatatum, iii. 646.
—— *dimorphum*, iii. 654.
—— divaricatum, iii. 657.
—— *divaricatum*, iii. 665.
—— *divergens*, iii. 646.
—— eatoni, iii. 657.
—— echinolepis, iii. 657.
—— *ehrenbergianum*, iii. 663.
—— elasticum, iii. 657.
—— *elasticum*, iii. 671.
—— *ellipsoideum*, iii. 660.
—— elongatum, iii. 657.
—— *elongatum*, iii. 677.
—— *falcaria*, iii. 663.
—— fallax, iii. 658.
—— *fasciale*, iii. 661.
—— faucium, iii. 658.
—— feei, iii. 658.
—— *ferrugineum*, iii. 666.
—— *filicula*, iii. 657.
—— flavopunctatum, iii. 658.
—— flexile, iii. 657.
—— fraternum, iii. 658.
—— fraxinifolium, iii. 658.
—— friedrichsthalianum, iii. 658.
—— *fulvum*, iii. 655.
—— furfuraceum, iii. 659.
—— galeottii, iii. 659.
—— ghiesbreghtii, iii. 659.
—— *gibbosum*, iii. 671.
—— glanduliferum, iii. 659.
—— *glaucinum*, iii. 655.
—— glaucophyllum, iv. 116.
—— *gonatodes*, iii. 667.
—— *griseum*, iii. 594.
—— griseum, iii. 659.
—— guatemalense, iii. 659.
—— guillemineanum, iii. 659.
—— hahnii, iii. 660.
—— hartwegianum, iii. 660.
—— hemsleyanum, iii. 660.
—— heteromorphum, iii. 660.
—— *heteromorphum*, iv. 298.
—— heterophlebium, iii. 660.
—— *hirsutissimum*, iii. 662.
—— *imbricatum*, iii. 644, 651.
—— *inæquale*, iii. 659.
—— incanum, iii. 660; iv. 116.
—— *incanum*, var. *fimbriatum*, iii. 671.
—— ——, var. *umbrosum*, iii. 671.
—— *insigne*, iii. 667.
—— *irregulare*, iii. 672.
—— *isomerum*, iii. 663.
—— jubæforme, iii. 661.
—— *jubæforme*, iii. 657.
—— *juglandifolium*, iii. 642.
Polypodium jungermannoides, iii. 661.
—— *karwinskyanum*, iii. 659, 666.
—— kuhnii, iii. 661.
—— *lætum*, iii. 663.
—— lævigatum, iii. 661.
—— *lævigatum*, iii. 661.
—— lanceolatum, iii. 661; iv. 116.
—— *lanceolatum*, iv. 298.
—— *lanosum*, iii. 655.
—— *lanuginosum*, iii. 671.
—— lasiopus, iii. 662.
—— *laxifrons*, iii. 670.
—— *laxum*, var. *majus*, iii. 670.
—— legionarium, iii. 662.
—— lepidopteris, iii. 662.
—— *lepidotum*, iii. 661.
—— leptostomum, iii. 662.
—— *lesourdianum*, iii. 667.
—— *leucostichum*, iii. 659.
—— *lherminieri*, iii. 670.
—— *lindenianum*, iii. 658.
—— *litigiosum*, iii. 645.
—— longepinnulatum, iii. 662.
—— longicaudatum, iii. 662.
—— loriceum, iii. 663; iv. 116.
—— *loriceum*, iii. 667.
—— lycopodioides, iii. 663.
—— macrocarpum, iii. 663.
—— *macrodon*, iii. 662.
—— *madrense*, iii. 666.
—— marginellum, iii. 663.
—— martensii, iii. 663.
—— *megalodus*, iii. 670.
—— meniscifolium, iii. 664.
—— meniscoides, iii. 664.
—— mitchellæ, iii. 664.
—— moniliforme, iii. 664.
—— *moniliforme*, iv. 298.
—— neriifolium, iii. 664; iv. 116.
—— *neriifolium*, iii. 664, 655.
—— nicaraguense, iii. 665.
—— nicotianæfolium, iii. 665.
—— *nivosum*, iii. 659.
—— *olivaceum*, iii. 663.
—— *otites*, iii. 663, 664.
—— *oulolepis*, iii. 666.
—— *paradisæ*, iii. 665.
—— *parkeri*, iii. 594.
—— patens, iii. 665.
—— pectinatum, iii. 665; iv. 116.
—— *pectinatum*, iii. 657, 664.
—— percussum, iii. 665; iv. 116.
—— *peruvianum*, iii. 664.
—— phyllitidis, iii. 665.
—— piloselloides, iii. 666; iv. 116.
—— pilosissimum, iii. 666.
Polypodium platylepis, iii. 666.
—— *platyphyllum*, iii. 667.
—— plebeium, iii. 666; iv. 116.
—— *plebeium*, iv. 298.
—— plectolepis, iii. 667.
—— plesiosorum, iii. 667.
—— *pleurosorum*, iii. 655.
—— *plumula*, iii. 657, 670.
—— *polylepis*, iii. 661.
—— polystichoides, iii. 667.
—— *preslianum*, iii. 664.
—— pruinatum, iii. 667.
—— *pruinatum*, iii. 594.
—— *pteropus*, iii. 670.
—— puberulum, iii. 667.
—— *puberulum*, iii. 660, 663.
—— pubescens, iii. 668.
—— *pulchrum*, iii. 657.
—— *pycnolepis*, iii. 668.
—— *recurvatum*, iii. 665.
—— refulgens, iii. 668.
—— repens, iii. 668.
—— reptans, iii. 668.
—— *rhachipterygium*, iii. 671.
—— *rhagadiolepis*, iii. 671.
—— rheosorum, iii. 668.
—— *rhodopleuron*, iii. 667.
—— rigescens, iii. 668.
—— *rigescens*, iii. 666; iv. 298.
—— rigidum, iii. 668.
—— *rigidum*, iii. 668.
—— *rivulorum*, iii. 645.
—— rude, iii. 668.
—— *schaffneri*, iii. 669.
—— *schkuhrii*, iii. 657, 665.
—— *sepultum*, iii. 662.
—— serrulatum, iii. 669.
—— sessilifolium, iii. 669.
—— skinneri, iii. 669.
—— *sloanei*, iii. 644.
—— sororium, iii. 669.
—— *sororium*, iii. 658.
—— sphenodes, iii. 669.
—— *sporadocarpum*, iii. 655.
—— squamatum, iii. 669; iv. 116.
—— stenoloma, iii. 669.
—— *subcrenatum*, iii. 664.
—— *subincisum*, iii. 648.
—— subpetiolatum, iii. 669.
—— *subpetiolatum*, iii. 670.
—— subscabrum, iii. 670.
—— subsessile, iii. 670.
—— suspensum, iii. 670.
—— *suspensum*, iii. 662.
—— *tæniosum*, iii. 654.
—— tatei, iii. 670.

Polypodium taxifolium, iii. 670.
—— tetragonum, iii. 670.
—— *tetragonum,* iii. 645.
—— thyssanolepis, iii. 670; iv. 116.
—— trichomanoides, iii. 671; iv. 116.
—— *trilobatum,* iii. 655.
—— trilobum, iii. 671.
—— truncicola, iii. 671.
—— undulatum, iii. 671.
—— *undulatum,* var. *parvulum,* iii. 671.
—— vaccinifolium, iii. 671.
—— vanheurckii, iii. 671.
—— *virginianum,* iii. 658.
—— vulgare, iii. 672.
—— *wagneri,* iii. 665.
—— *xiphopteroides,* iii. 666.
POLYPOGON, iii. 552.
Polypogon, iii. 515.
Polypogon brachyphyllus, iii. 552.
—— *ciliatus,* iii. 539.
—— elongatus, iii. 552.
—— mexicanus, iii. 553.
—— *monspeliensis,* iii. 552.
—— *tenellus,* iii. 542.
POLYPREMUM, ii. 340.
Polypremum linnæi, ii. 340.
—— procumbens, ii. 340.
—— *schlechtendalii,* ii. 340.
Polypteris, iv. 59.
—— *latifolia,* iv. 59.
—— *lindeni,* iv. 59.
—— *texana,* iv. 59.
POLYSTACHYA, iii. 248.
Polystachya cerea, iii. 248.
—— *cerea,* iv. 303.
—— clavata, iii. 248.
—— lineata, iii. 248.
—— luteola, iii. 248.
—— *luteola,* iv. 269, 270.
—— *minuta,* iii. 221.
—— masayensis, iii. 249.
—— *zeylanica,* iii. 249.
POLYSTEMMA, ii. 336.
Polystemma, iv. 254.
Polystemma viridiflora, ii. 336.
Polystichum aculeatum, iii. 642.
—— *amplificatum,* iii. 642.
—— *confluens,* iii. 642
—— *cystopteroides,* iii. 649.
—— *distans,* iii. 642.
—— *drepanoides,* iii. 642.
—— *grande,* iii. 642.
—— *hartwegii,* iii. 642.
—— melanostictum, iii. 643.
Polystichum melanostictum, iii. 643.
—— *moritzianum,* iii. 642.
—— *mülleri,* iii. 642.
—— *muricatum,* iii. 642.
—— *ordinatum,* iii. 642.
—— *pallidum,* iii. 642.
—— *platyphyllum,* iii. 642.
—— *rhachichlæna,* iii. 642.
—— *seemanni,* iii. 643.
—— semicordatum, iii. 643.
—— *vestitum,* iii. 642.
Polytænium lanceolatum, iii. 680.
Polythysania parviflora, ii. 484.
Pomaria humilis, i. 326.
—— *melanosticta,* i. 326.
Pomatium, ii. 37.
POMEÆ, i. 379.
PONERA, iii. 223.
Ponera albida, iii. 223.
—— amethystina, iii. 223.
—— *behrii,* iii. 219.
—— bilineata, iii. 223.
—— *dubia,* iii. 219.
—— graminifolia, iii. 223.
—— juncifolia, iii. 223.
—— *kienastii,* iii. 219.
—— macroglossa, iii. 223.
—— *mesocopis,* iii. 220.
—— striata, iii. 223.
—— *striata,* iv. 301.
—— striolata, iii. 223.
Pongatium indicum, ii. 270.
PONTEDERIA, iii. 383.
Pontederia azurea, iii. 384.
—— cordata, iii. 383.
—— *cordifolia,* iii. 384.
—— *lanceolata,* iii. 383.
—— *limosa,* iii. 385.
—— rotundifolia, iii. 384.
PONTEDERIACEÆ, iii. 383.
Pontederiaceæ, iv. 197, 204, 217, 231.
PONTHIEVA, ii. 299.
Ponthieva ephippium, iii. 299.
—— glandulosa, iii. 299.
—— *glandulosa,* iv. 269, 270.
—— guatemalensis, iii. 299.
—— oblongifolia, iii. 299.
—— *oblongifolia,* iv. 301.
POPULUS, iii. 180.
Populus angustifolia, iii. 181.
—— balsamifera, iii. 180.
—— canadensis, iii. 181.
—— fremontii, var. ? wislizenii, iv. 88.
—— mexicana, iii. 181.
Porcelia, i. 14; iv. 96.
Porcelia hahniana, i. 15.
Porliera angustifolia, iv. 140.
POROPHYLLUM, ii. 216.
Porophyllum, iv. 60, 252.
Porophyllum amplexicaule, ii. 216.
—— coloratum, ii. 216.
—— decumbens, ii. 216.
—— *ellipticum,* iv. 60.
—— ervendbergii, iv. 60.
—— filifolium, iv. 60.
—— gracile, iv. 60.
—— greggii, ii. 216.
—— jorullense, ii. 217.
—— linaria, ii. 217; iv. 60.
—— lindenii, ii. 217.
—— linifolium, ii. 217.
—— macrocephalum, ii. 217; iv. 60.
—— nummularium, ii. 217.
—— obtusifolium, ii. 217.
—— scoparium, ii. 217; iv. 60.
—— *scoparium,* iv. 141.
—— seemannii, ii. 217.
—— tagetoides, ii. 217.
—— viridiflorum, ii. 217.
PORPHYROSPATHA, iii. 424.
Porphyrospatha, iv. 278.
Porphyrospatha hoffmannii, iii. 424.
—— schottiana, iii. 424.
Portesia ovata, i. 183.
PORTLANDIA, ii. 14.
Portlandia mexicana, ii. 14.
—— *mexicana,* ii. 13.
PORTULACA, i. 78.
Portulaca foliosa, i. 78.
—— oleracea, i. 78.
—— pilosa, i. 78.
PORTULACEÆ, i. 77; iv. 12.
Portulaceæ, iv. 174, 204, 211, 216, 224, 229, 234.
POSOQUERIA, ii. 39.
Posoqueria coriacea, ii. 39.
—— latifolia, ii. 39.
—— macrophylla, ii. 39.
—— *panamensis,* ii. 39.
POTAMOBRYON, iii. 40.
Potamobryon concinnum, iii. 40.
—— laxum, iii. 40.
—— patulum, iii. 40.
POTAMOGETON, iii. 441.
Potamogeton angustifolium, iii. 441.
—— angustissimum, iii. 441.
—— hybridus, iii. 441.
—— liebmanni, iii. 441.
—— lonchitis, iii. 441.
—— lucens, iii. 441.
—— natans, iii. 441.
—— pauciflorus, iii. 441.
—— pectinatus, iii. 442.

Potamogeton perfoliatus, iii. 442.
POTENTILLA, i. 375.
Potentilla, iv. 149, 150.
—— *ancistrifolia*, i. 376.
—— candicans, i. 375.
—— *candicans*, iv. 284.
—— comaroides, i. 376.
—— ehrenbergiana, i. 376.
—— *fusca*, i. 376.
—— hæmatochrous, i. 376.
—— *heptaphylla*, iv. 34.
—— *hiemalis*, i. 376.
—— *humboldtiana*, i. 375.
—— leptopetala, i. 376.
—— *leariloba*, i. 375.
—— *macrorhiza*, i. 376.
—— norvegica, iv. 34.
—— ovalis, i. 376.
—— paradoxa, i. 376.
—— ranunculoides, i. 376.
—— *ranunculoides*, iv. 284.
—— richardii, i. 376.
—— *richardii*, iv. 284.
POTENTILLEÆ, i. 373.
POTERIEÆ, i. 376.
Pothomorphe lessertiana, iii. 47.
—— *ottonis*, iii. 53.
—— *peltata*, iii. 53.
—— *umbellata*, iii. 56.
Pothos, iv. 301.
—— *crassinervia*, iii. 430.
—— *laciniatus*, iii. 433.
—— *podophyllus*, iii. 433.
—— *violaceus*, iii. 434.
POUROUMA, iii. 152.
Pourouma asper, iii. 152.
Pourretia platanifolia, i. 126.
POUZOLZIA, iii. 159.
Pouzolzia guatemalana, iii. 159.
—— obliqua, iii. 159.
—— occidentalis, iii. 159.
—— latifolia, iii. 159.
PRESCOTTIA, iii. 298.
Prescottia colorans, iii. 298.
—— galeottii, iii. 298.
—— lindeniana, iii. 298.
—— orchioides, iii. 299.
—— pachyrhiza, iii. 299.
PRESTONIA, ii. 311.
Prestonia contorta, ii. 311.
—— glabrata, ii. 311.
—— ipomœifolia, ii. 311.
—— macrocarpa, ii. 311.
—— mexicana, ii. 312.
—— schizadenia, ii. 312.
—— *seemanni*, ii. 311.
—— sericea, ii. 312.
Prestonia tomentosa, ii. 311.
PRIMULACEÆ, ii. 287; iv. 67.
Primulaceæ, iv. 185, 205, 215, 217, 225, 229.
PRINGLEOPHYTUM, iv. 80.
Pringleophytum lanceolatum, iv. 80.
Prinos, i. 186.
Prionoplectus forseithii, ii. 484.
Prionostemma setulifera, i. 194.
PRIORIA, i. 342.
Prioria copaifera, i. 342.
Pristimera tenella, iv. 98.
—— *tenella*, i. 194.
PRIVA, ii. 532.
Priva aspera, ii. 532.
—— *crenata*, ii. 532.
—— echinata, ii. 532; iv. 107, 113.
—— hispida, ii. 533.
—— *lamiifolia*, ii. 532.
—— *mexicana*, ii. 533.
—— *trachelioides*, ii. 532.
Proboscidea altheæfolia, ii. 499.
—— *botterii*, ii. 499.
—— *fragrans*, ii. 499.
—— *jussiæi*, ii. 500.
—— *triloba*, ii. 500.
—— *violacea*, ii. 499.
Prochnyanthes, iv. 274.
PROCKIA, i. 141.
Prockia crucis, i. 141.
—— mexicana, iv. 15.
—— obovata, i. 141.
PROCKIEÆ, i. 141.
Proclesia, iv. 157.
—— *acuminata*, ii. 272.
—— *benthamiana*, ii. 272.
—— *pubescens*, ii. 273.
—— *veraguensis*, ii. 273; iv. 159.
—— *warscewiczii*, ii. 274.
PROSERPINACA, i. 400.
Proserpinaca palustris, i. 400.
PROSOPIS, i. 344.
Prosopis, i. 527; iv. 140, 142, 144, 162.
Prosopis cinerascens, i. 344.
—— *domingensis*, i. 344.
—— *dulcis*, i. 344; iv. 303.
—— *emoryi*, i. 344.
—— heterophylla, i. 344.
—— *horrida*, i. 344.
—— juliflora, i. 344.
—— *juliflora*, iv. 141.
—— *microphylla*, i. 355.
—— pubescens, i. 344.
—— *pubescens*, iv. 141.
Prosthechea glauca, iii. 231.
PROTEACEÆ, iii. 77.
Proteaceæ, iv. 192, 205, 234.
Proustia mexicana, ii. 256; iv. 65.
—— *reticulata*, ii. 256.
PRUNEÆ, i. 367.
Prunella, ii. 570.
—— *vulgaris*, iv. 149.
PRUNUS, i. 367; iv. 166.
Prunus brachybotrya, i. 367.
—— capuli, i. 367.
—— *capuli*, iv. 284.
—— demissa, i. 368.
—— glandulosa, iv. 34.
—— laurifolia, i. 368.
—— mexicana, iv. 34.
—— microphylla, i. 368.
—— minutiflora, i. 368.
—— occidentalis, i. 368.
—— salicifolia, i. 368.
—— samydoides, i. 368.
—— virginiana, i. 368.
Psacalium laxiflorum, ii. 243.
—— *peltatum*, ii. 245.
—— *thyrsoideum*, ii. 242.
PSATHYROTES, ii. 229.
Psathyrotes ramosissima, ii. 229.
—— scaposa, ii. 229.
—— *scaposa*, iv. 141.
—— schottii, ii. 229.
Pseudepidendrum spectabile, iii. 238.
Pseudocaryophyllus seemanni, i. 407.
PSEUDOCENTRUM, iii. 299.
Pseudocentrum hoffmanni, iii. 299.
PSEUDOCROTON, iii. 120.
Pseudocroton, iv. 260.
Pseudocroton tinctorius, iii. 120.
PSEUDOLMEDIA, iii. 149.
Pseudolmedia havanensis, iii. 149.
Pseudoryzeæ, iii. 531.
Pseudosmodingium, iv. 25.
Pseudosmodingium andrieuxii, iv. 25.
—— perniciosum, iv. 25.
—— virletii, iv. 25.
PSEUDOTSUGA, iii. 189.
Pseudotsuga, iv. 265.
Pseudotsuga douglasii, iii. 190; iv. 89.
—— *douglasii*, iv. 142.
—— *lindleyana*, iii. 190.
PSIDIUM, i. 406.
Psidium araca, i. 406.
—— costaricense, i. 406.
—— *costaricense*, iv. 157.
—— gracile, i. 406.
—— *guava*, i. 406.
—— laurifolium, i. 406.
—— molle, i. 406.
—— œrstedianum, i. 406.

Psidium polycarpon, i. 406.
—— *polycarpum*, iv. 167.
—— pomiferum, i. 406; iv. 100, 112.
—— *pyriferum*, i. 406.
—— robustum, i. 406.
—— schiedeanum, i. 406.
PSILACTIS, ii. 119.
Psilactis asteroides, ii. 119.
—— brevilingulata, ii. 119; iv. 53.
—— coulteri, ii. 119.
Psilocarya, iii. 458.
—— *robusta*, iii. 467.
—— *schiedeana*, iii. 465.
Psilostachys geonomæformis, iii. 404.
Psilostrophe gnaphalodes, ii. 211.
PSILOTUM, iii. 703.
Psilotum complanatum, iii. 703; iv. 95.
—— triquetrum, iii. 703.
—— *triquetrum*, iii. 700.
Psittacanthus kerberi, iv. 84.
—— *macrantherus*, iii. 81.
Psittacoglossum atratum, iii. 264, 268.
PSORALEA, i. 234.
Psoralea citriodora, i. 238.
—— esculenta, i. 234.
—— floribunda, i. 234.
—— *lagopus*, i. 242.
—— *lutea*, i. 243.
—— melanocarpa, i. 234.
—— *nutans*, i. 244.
—— pentaphylla, i. 235.
—— *phymatodes*, i. 244.
—— *reclinata*, i. 245.
—— rhombifolia, iv. 26.
PSYCHOTRIA, ii. 47.
Psychotria, iv. 213, 249, 299.
Psychotria acuminata, ii. 48.
—— alba, ii. 48.
—— *ardisiæfolia*, ii. 48.
—— aureola, ii. 48.
—— barbiflora, ii. 48.
—— biaristata, ii. 48.
—— bracteolata, ii. 48.
—— *bracteolata*, iv. 287.
—— chontalensis, iv. 47.
—— concolor, ii. 48.
—— costaricensis, ii. 48.
—— cyanococca, iv. 48.
—— elongata, ii. 48.
—— erythrocarpa, ii. 48.
—— excelsa, ii. 48.
—— ferruginea, ii. 50.
—— flexuosa, ii. 48.
—— furcata, ii. 49.
—— glauca, ii. 49.
—— graciliflora, ii. 49.
Psychotria granadensis, ii. 49.
—— grandis, ii. 49.
—— hænkeana, ii. 49, 51.
—— hebeclada, ii. 49.
—— *hebeclada*, iv. 156.
—— *herbacea*, ii. 54.
—— hirta, ii. 50.
—— justicioides, ii. 49.
—— lævis, ii. 49.
—— longicollis, ii. 49.
—— marginata, ii. 49.
—— mexicana, ii. 48, 49.
—— microdesmia, ii. 49.
—— miradorensis, ii. 50.
—— mollis, ii. 50.
—— moræ, ii. 50.
—— nicaraguensis, ii. 50.
—— nicotianæfolia, ii. 50.
—— obovata, ii. 50.
—— padifolia, ii. 50.
—— papantlensis, ii. 50.
—— parvifolia, ii. 50.
—— pilosa, ii. 50.
—— pubescens, ii. 50.
—— quinqueradiata, ii. 50.
—— rufescens, ii. 50.
—— salicifolia, ii. 51.
—— scabriuscula, ii. 51.
—— sessilifolia, ii. 51.
—— stipulata, ii. 51.
—— subsessilis, ii. 51.
—— tomentosa, ii. 51.
—— trichotoma, ii. 51.
—— uliginosa, ii. 51.
—— *violacea*, ii. 54.
—— undata, iv. 112.
PSYCHOTRIEÆ, ii. 47.
PTELEA, i. 170.
Ptelea angustifolia, i. 170.
—— parvifolia, i. 170.
—— *parvifolia*, iv. 17.
—— pentandra, i. 171.
—— podocarpa, i. 171.
—— trifoliata, i. 171.
PTERIDEÆ, iii. 607.
PTERIS, iii. 621.
Pteris aculeata, iii. 621; iv. 114.
—— *aculeata*, iii. 623.
—— *acutangula*, iii. 621.
—— *æqualis*, iii. 624.
—— *andromedæfolia*, iii. 618.
—— *apicalis*, iii. 621, 622.
—— aquilina, iii. 622; iv. 116.
—— ——, var. caudata, iv. 109.
—— *aquilina*, iv. 110, 144, 149.
—— *arborescens*, iii. 623.
—— biaurita, iii. 622.
Pteris biaurita, iii. 625.
—— *cartilaginea*, iii. 621.
—— *caudata*, iii. 622.
—— *cordata*, iii. 619.
—— *coriacea*, iii. 624.
—— cretica, iii. 622.
—— *decomposita*, iii. 622.
—— *deflexa*, iii. 624.
—— *edentula*, iii. 622.
—— elata, iii. 623.
—— *fallax*, iii. 620.
—— *feei*, iii. 622.
—— *glauca*, iii. 619.
—— grandifolia, iii. 623.
—— *grandifolia*, iii. 624, 625.
—— hænkeana, iii. 623.
—— incisa, iii. 623; iv. 116.
—— *intramarginalis*, iii. 620.
—— kunzeana, iii. 623.
—— *kunzeana*, iii. 622.
—— laciniata, iii. 623.
—— *lanuginosa*, iii. 622.
—— *lata*, iii. 624.
—— longifolia, iii. 624.
—— *lutea*, iii. 613.
—— *mexicana*, iii. 622.
—— muricella, iii. 624.
—— *nemoralis*, iii. 622.
—— *orizabæ*, iii. 621, 622.
—— palmata, iii. 624; iv. 116.
—— paucinervata, iii. 624.
—— *pedata*, iii. 624.
—— *plumieri*, iii. 622.
—— podophylla, iii. 624.
—— *podophylla*, iii. 622, 625.
—— *propinqua*, iii. 621.
—— *protea*, iii. 621, 623.
—— *pubescens*, iii. 622.
—— pulchra, iii. 624.
—— *pulchra*, iii. 623, 625.
—— pungens, iii. 625.
—— *pungens*, iii. 622.
—— quadriaurita, iv. 116.
—— *quadriaurita*, iii. 622, 625.
—— *rigida*, iii. 621.
—— *rostrata*, iii. 624.
—— *schiedeana*, iii. 623.
—— *serrulata*, iii. 622.
—— *setifera*, iii. 622.
—— *swartziana*, iii. 624.
—— *ternifolia*, iii. 621.
—— *trifolia*, iii. 622.
—— *triphylla*, iii. 621, 622.
—— *vespertilionis*, iii. 623.
PTEROCARPUS, i. 316.
Pterocarpus amphymenium, i. 316.
—— crispatus, i. 316.

Pterocarpus draco, i. 316; iv. 112.
—— hayesii, i. 316.
—— *officinalis*, i. 316.
—— *rohrii*, i. 317.
—— *rufescens*, i. 317.
PTEROGASTRA, i. 418.
Pterogastra cupheoides, i. 418.
PTEROLEPIS, i. 417.
Pterolepis exigua, i. 417.
—— ladanoides, i. 418; iv. 36.
—— *ladanoides*, iv. 242.
—— œrstedii, i. 418.
Pteronia porophyllum, ii. 218.
Pterophyton alatum, ii. 186.
Pteropsis angustifolia, iii. 654, 681.
—— *lanceolata*, iii. 682.
Pteroscleria, iii. 468.
PTEROSPORA, ii. 285.
Pterospora andromedea, ii. 285.
PTEROSTEMON, i. 370.
Pterostemon mexicanus, i. 370.
Ptilocalyx greggi, ii. 371.
Ptilostephium coronopifolium, ii. 207.
—— *trifidum*, ii. 208.
Ptychophyllum sulcatum, iii. 506.
Puya grandiflora, iii. 315.
—— *heterophylla*, iii. 316.
—— *longifolia*, iii. 316.
—— *warscewiczii*, iii. 315.
Pycreus olfersianus, iii. 450.
Pyrenoglyphis balanoidea, iii. 412.
Pyrethrum bonplandianum, ii. 110.
—— *parthenium*, ii. 230.
PYROLA, ii. 283.
Pyrola, iv. 254, 302, 303, 304.
Pyrola angustifolia, ii. 283.
—— *angustifolia*, iv. 290.
—— liebmannii, ii. 283.
—— *maculata*, ii. 283.
—— *rotundifolia*, ii. 283.
—— sartorii, ii. 283.
—— *sartorii*, iv. 290.
—— secunda, ii. 283.
—— *secunda*, iv. 290.
—— *umbellata*, ii. 283.
PYRRHOPAPPUS, ii. 261.
Pyrrhopappus carolinianus, ii. 261.
—— multicaulis, ii. 261.
—— pauciflorus, ii. 261.
—— sessæanus, ii. 261.

Quamoclidion multiflorum, iii. 2.
—— *nyctagineum*, iii. 2.
—— *oxybaphoides*, iii. 3.
Quamoclit, iv. 256.
—— *coccinea*, ii. 385.
—— *globosa*, ii. 391.
Quamoclit grandiflora, ii. 389.
—— *hastigera*, ii. 387.
—— *hederifolia*, ii. 387.
—— lutea, ii. 389.
—— *mina*, ii. 395.
—— *pedata*, ii. 384.
—— *russelliæflora*, ii. 387.
—— *serotina*, ii. 393.
—— *triloba*, ii. 395.
—— tubulosa, ii. 395.
—— *vitifolia*, ii. 387, 391.
—— *vulgaris*, ii. 393.
QUARARIBEA, i. 127.
Quararibea, i. 128; iv. 237.
—— *guianensis*, i. 127.
—— pterocalyx, i. 127.
QUASSIA, i. 172.
Quassia, iv. 230.
Quassia amara, i. 172.
—— grandiflora, i. 172.
QUERCINEÆ, iii. 166.
QUERCUS, iii. 166.
Quercus, iv. 127, 155, 164, 212, 260, 261, 263, 264, 265, 303.
Quercus abbreviata, iii. 178.
—— *acuminata*, iii. 168.
—— acutifolia, iii. 167.
—— *affinis*, iii. 174, 175; iv. 262.
—— agrifolia, iii. 167.
—— *alamo*, iii. 168; iv. 262.
—— *ambigua*, iii. 175.
—— angustifolia, iii. 167.
—— aristata, iii. 167.
—— *aristata*, iv. 167.
—— barbinervis, iii. 168.
—— benthami, iii. 168.
—— bonplandi, iii. 167.
—— *bonplandiana*, iii. 175.
—— bourgæi, iii. 168.
—— brachystachys, iii. 168.
—— bullata, iii. 178.
—— bumelioides, iii. 178.
—— *bumelioides*, iv. 167.
—— *callosa*, iii. 177.
—— calophylla, iii. 168.
—— candicans, iii. 168.
—— castanea, iii. 168.
—— *chianantlensis*, iii. 170.
—— chrysophylla, iii. 169.
—— *chrysophylla*, iv. 263.
—— circinata, iii. 169.
—— citrifolia, iii. 169.
—— *citrifolia*, iv. 158, 293.
—— communis, iii. 178.
—— *commutata*, iii. 174.
—— confertifolia, iii. 169; iv. 87.
—— conspersa, iii. 167.
Quercus cordata, iii. 169.
—— corrugata, iii. 169.
—— cortesii, iii. 169.
—— costaricensis, iii. 169.
—— *costaricensis*, iv. 157, 158, 293.
—— crassifolia, iii. 170; iv. 88.
—— *crassifolia*, iii. 177.
—— crassipes, iii. 170.
—— *cubana*, iii. 178.
—— cuneifolia, iii. 170.
—— *decipiens*, iii. 176.
—— depressa, iii. 170.
—— *depressa*, iv. 293.
—— diversifolia, iii. 178.
—— dysophylla, iii. 170.
—— elliptica, iii. 170.
—— emoryi, iii. 170.
—— *emoryi*, iv. 140, 141.
—— eugeniæfolia, iii. 171.
—— excelsa, iii. 171.
—— flavida, iii. 171.
—— *flavida*, iv. 293.
—— floccosa, iii. 171.
—— *floccosa*, iv. 293.
—— fulva, iii. 171.
—— *furfuracea*, iii. 167.
—— galeottii, iii. 171.
—— *galeottii*, iv. 262.
—— gambelii, iii. 171.
—— germana, iii. 171.
—— ghiesbreghtii, iii. 171.
—— *ghiesbreghtii*, iv. 262, 293.
—— glabrata, iii. 169.
—— *glabrata*, iv. 262.
—— glabrescens, iii. 172.
—— *glabrescens*, iv. 167, 293.
—— glaucescens, iii. 172.
—— glaucoides, iii. 172.
—— grahami, iii. 172.
—— grandis, iii. 172.
—— granulata, iii. 172; iv. 157, 158.
—— greggii, iii. 176.
—— grisea, iv. 88.
—— guatemalensis, iii. 172.
—— hartwegi, iii. 175.
—— *hastata*, iii. 170.
—— *humboldtii*, iv. 261.
—— insignis, iii. 172.
—— *insignis*, iv. 262, 293.
—— integrifolia, iii. 172.
—— *intermedia*, iii. 168.
—— *jalapensis*, iv. 262.
—— jurgensenii, iii. 172.
—— læta, iii. 173.
—— lanceolata, iii. 173
—— *lanceolata*, iii. 175; iv. 262.

Quercus lancifolia, iii. 173.
—— *lancifolia*, iii. 174.
—— lanigera, iii. 173.
—— *lanigera*, iv. 293.
—— *laurifolia*, iv. 262.
—— laurina, iii. 173.
—— laxa, iii. 173.
—— leiophylla, iii. 173.
—— linguæfolia, iii. 173.
—— longifolia, iii. 167.
—— lutea, iii. 174.
—— lutescens, iii. 173.
—— macrophylla, iii. 174.
—— magnoliæfolia, iii. 173.
—— major, iii. 174.
—— mexicana, iii. 169.
—— *mexicana*, iii. 170.
—— ——, var. *glabrata*, iii. 169.
—— microcarpa, iii. 167, 170.
—— microphylla, iii. 174.
—— mollis, iii. 174.
—— *mucronata*, iii. 168.
—— nectandræfolia, iii. 174.
—— nitens, iii. 174.
—— *nitida*, iii. 167.
—— *nudinervis*, iii. 175.
—— oaxacana, iii. 175.
—— obtusata, iii. 175.
—— *obtusata*, iii. 173.
—— ocoteæfolia, iii. 174.
—— *oleoides*, iii. 178; iv. 262.
—— omissa, iii. 175.
—— *oocarpa*, iii. 178.
—— orizabæ, iii. 175.
—— *orizabæ*, iv. 293.
—— *oxyadenia*, iii. 167.
—— pallidior, iii. 177.
—— pandurata, iii. 175.
—— peduncularis, iii. 177.
—— *perseæfolia*, iii. 170.
—— *petiolaris*, iii. 175; iv. 262, 263.
—— podocarpa, iii. 174.
—— polymorpha, iii. 175.
—— *polymorpha*, iv. 262.
—— pulchella, iii. 175.
—— *pulchella*, iv. 263.
—— *pungens*, iii. 170.
—— repanda, iii. 176.
—— *repanda*, iii. 174.
—— *resinosa*, iii. 174.
—— reticulata, iii. 176.
—— *reticulata*, iv. 263, 293, 294.
—— *retusa*, iii. 178.
—— *rugosa*, iii. 170.
—— rugulosa, iii. 176.
—— salicifolia, iii. 176.
—— *salicifolia*, iii. 177; iv. 263.
Quercus sapotæfolia, iii. 176.
—— sartorii, iii. 176.
—— scytophylla, iii. 176.
—— seemannii, iii. 177.
—— *seemannii*, iv. 167.
—— segoviensis, iii. 177.
—— serra, iii. 177.
—— sideroxyla, iii. 177.
—— skinneri, iii. 177.
—— *skinneri*, iv. 263.
—— sororia, iii. 177.
—— *spicata*, iii. 176; iv. 263.
—— *spinulosa*, iii. 170.
—— splendens, iii. 177.
—— *stipularis*, iii. 177.
—— strombocarpa, iii. 177.
—— subintegra, iii. 174.
—— sublobata, iii. 168.
—— tlalpuxahuensis, iii. 177.
—— tomentosa, iii. 177.
—— *tomentosa*, iv. 262, 263.
—— totutlensis, iii. 178.
—— tridens, iii. 168.
—— *tristis*, iii. 168.
—— *tuberculata*, iii. 175.
—— *turbinata*, iii. 172.
—— *undulata*, iii. 168.
—— *varians*, iii. 175.
—— virens, iii. 178.
—— *virens*, iv. 152, 261, 264.
—— warscewiczii, iii. 178.
—— *warscewiczii*, iv. 167.
—— wislizenii, iii. 178.
—— xalapensis, iii. 178.
QUILLAJEÆ, i. 369.
Quillajeæ, i. 173.

Raddisia grandiflora, iv. 111.
Rafinesquia neo-mexicana, iv. 141.
Rajania, iii. 53.
Ramaclea funebris, iii. 326.
Ramalina, iv. 149.
RANDIA, ii. 40.
Randia, iv. 101.
Randia aculeata, iv. 101.
—— echinocarpa, ii. 40.
—— karstenii, ii. 40.
—— latifolia, ii. 40; iv. 101.
—— longiloba, iv. 101.
—— *monantha*, ii. 39.
—— mussændæ, ii. 40.
—— obovata, ii. 40.
—— ovata, ii. 40.
—— xalapensis, ii. 40; iv. 47.
RANUNCULACEÆ, i. 1; iv. 1.
Ranunculaceæ, iv. 171, 203, 216, 224, 235.
RANUNCULEÆ, i. 5.
RANUNCULUS, i. 5.
Ranunculus, iv. 147, 150.
Ranunculus amarillo, i. 6.
—— *aquatilis*, var., i. 6.
—— aschenbornianus, i. 6.
—— cymbalaria, i. 6.
—— delphinifolius, i. 6.
—— *delphinifolius*, i. 7.
—— dichotomus, i. 6; iv. 2.
—— *dichotomus*, i. 7.
—— donianus, i. 6.
—— galeotti, iv. 2.
—— geoides, i. 6; iv. 2.
—— *geoides*, iv. 150, 282.
—— *hispidus*, i. 7.
—— hookeri, i. 6; iv. 2.
—— *hookeri*, iv. 149.
—— *humilis*, i. 6.
—— hydrocharis, i. 6.
—— hydrocharoides, i. 7.
—— llaveanus, i. 7.
—— *llaveanus*, iv. 149.
—— *longirostris*, i. 6.
—— microcarpus, i. 7.
—— multicaulis, i. 7.
—— *ophioglossifolius*, i. 8.
—— ornithorrhynchus, i. 7.
—— *ornithorrhynchus*, iv. 282.
—— oxynotus, i. 7.
—— pennsylvanicus, 7.
—— peruvianus, i. 7.
—— *peruvianus*, iv. 282.
—— petiolaris, i. 7.
—— *petiolaris*, iv. 282.
—— *pusillus*, i. 8.
—— repens, var.?, i. 8.
—— sibbaldioides, i. 7.
—— *sibbaldioides*, iv. 282.
—— stolonifer, i. 7.
—— trachyspermus, i. 8.
—— tridentatus, i. 8.
RAPATEACEÆ, iii. 397.
Rapateaceæ, iv. 197.
Raphanus raphanistrum, i. 40.
RAPHIA, iv. 91, 275.
Raphia nicaraguensis, iv. 92, 275.
—— *tædigera*, iv. 91, 275.
—— vinifera, iv. 91.
—— *vinifera*, iv. 92, 275.
Rapuntium circæoides, ii. 266.
—— ehrenbergii, ii. 266.
—— *laxiflorum*, ii. 267.
—— *micranthum*, ii. 268.
—— *nanum*, ii. 268.
—— neglectum, ii. 268.
—— *pauciflorum*, ii. 269.
—— *pusillum*, ii. 269.
—— *rapunculoides*, ii. 269.

Rapuntium splendens et *fulgens*, ii. 267.
—— *subtile*, ii. 268.
—— warscewiczii, ii. 269.
Raspailia agrostoides, iii. 553.
Rathea, iii. 407.
—— *fibrosa*, iii. 407.
RATONIA, i. 213.
Ratonia apetala, i. 213; iv. 111.
RAUWOLFIA, ii. 306.
Rauwolfia canescens, iv. 113.
—— heterophylla, ii. 307; iv. 68.
—— longifolia, ii. 307; iv. 68.
—— *ternifolia*, ii. 307.
Ravenala, iii. 312.
RAVNIA, ii. 12.
Ravnia, iv. 299.
Ravnia triflora, ii. 12.
—— *triflora*, iv. 287.
RAZISEA, ii. 514.
Razisea spicata, ii. 514.
Reana, iii. 512.
—— *giovanninii*, iii. 512.
—— *luxurians*, iii. 512.
Recchia, i. 13.
—— *mexicana*, i. 173.
Regelia, iii. 313.
Reineckia, iii. 407.
—— *triandra*, iii. 408.
REINHARDTIA, iii. 402.
Reinhardtia, iv. 276.
Reinhardtia elegans, iii. 402.
RELBUNIUM, ii. 62.
Relbunium aschenbornii, ii. 62; iv. 48.
—— ciliatum, ii. 62.
—— hypocarpium, ii. 63.
—— lævigatum, ii. 63.
—— microphyllum, ii. 63.
—— polyplocum, ii. 63.
REMIREA, iii. 464.
Remirea maritima, iii. 464.
RENEALMIA, iii. 309.
Renealmia, iv. 231.
Renealmia racemosa, iii. 309.
—— ruiziana, iii. 309.
Renggeria acuminata, i. 85.
Reseda luteola, i. 46.
RESEDACEÆ, i. 45.
Resedaceæ, iv. 172, 205, 216.
Restiaceæ, iv. 199.
RESTREPIA, iii. 208.
Restrepia dayana, iii. 206.
—— *lansbergii*, iii. 206.
—— muscifera, iii. 206.
—— ophiocephala, iii. 206.
—— prorepens, iii. 206.
Restrepia reichenbachiana, iii. 206.
—— ujarensis, iii. 206.
—— xanthophthalma, iii. 206.
RETINIPHYLLEÆ, ii. 41.
Reussia, iii. 383.
RHABDADENIA, ii. 317.
Rhabdadenia cordata, ii. 317.
RHABDIA, ii. 371.
Rhabdia lycioides, ii. 371.
Rhabdochloa virgata, iii. 559.
Rhachicallis, iv. 102, 110.
Rhachicallis rupestris, iv. 101.
RHAMNACEÆ, i. 195; iv. 22.
Rhamnaceæ, iv. 177, 203, 215, 217, 224, 229.
RHAMNEÆ, i. 197.
Rhamneæ, i. 195; iv. 148.
RHAMNUS, i. 197.
Rhamnus biniflorus, i. 197.
—— *biniflorus*, i. 196.
—— californicus, i. 197.
—— capreæfolius, i. 197.
—— *elegans*, i. 200.
—— *glomeratus*, i. 200.
—— humboldtianus, i. 197.
—— *humboldtianus*, i. 196.
—— *iguaneus*, iii. 138.
—— *laurifolius*, i. 197.
—— *micranthus*, iii. 140.
—— microphyllus, i. 198.
—— *minutiflorus*, i. 200.
—— mucronatus, i. 198.
—— *obtusifolius*, iv. 22.
—— *oleifolius*, i. 197.
—— serratus, i. 198.
—— *serrulatus*, i. 198.
—— spinosus, i. 198.
—— terniflorus, i. 198.
—— *tomentellus*, i. 197.
—— *triflorus*, var., i. 196.
—— umbellatus, i. 198.
Rhaphidophora, iii. 425.
Rhapidophyllum, iv. 277.
RHEEDIA, i. 88.
Rheedia, iv. 230.
Rheedia edulis, i. 88.
—— *lateriflora*, i. 88.
RHEXIA, i. 420.
Rhexia, iv. 242.
Rhexia fragilis, i. 420.
—— glandulosa, i. 420.
—— *ladanoides*, i. 418.
—— *pumila*, iv. 36.
—— *schiedeana*, var. *micrantha*, i. 419.
—— *tortuosa*, i. 419.
RHEXIEÆ, i. 419.
Rhinocarpus excelsa, i. 221; iv. 166.
Rhipidopteris peltata, iii. 688.
Rhipidopteris peltata, iii. 688.
RHIPSALIS, i. 548.
Rhipsalis, i. 501; iv. 202, 246.
—— *brachiata*, i. 549.
—— cassytha, i. 548.
—— *cassytha*, iv. 246.
—— coriacea, i. 549.
—— moçiniana, i. 548.
—— saglionis, i. 549.
RHIZOCARPEÆ, iii. 709.
Rhizocarpeæ, iv. 200, 205, 217.
RHIZOPHORA, i. 402.
Rhizophora, iv. 161, 165.
Rhizophora mangle, i. 402; iv. 112.
—— *mangle*, iv. 165, 230.
RHIZOPHORACEÆ, i. 401.
RHIZOPHOREÆ, i. 402.
Rhizophoreæ, i. 401; iv. 179, 205, 217, 230.
Rhodocalyx hypoleucus, ii. 315.
—— *lanuginosus*, ii. 316.
—— *suaveolens*, ii. 315.
RHODOCHITON, ii. 442.
Rhodochiton volubile, ii. 442.
Rhodochlamys speciosa, ii. 565.
Rhododendron ponticum, iv. 119.
Rhodoseris conspicua, ii. 254.
Rhodostoma gardenioides, ii. 52.
RHŒO, iii. 396.
Rhœo discolor, iii. 396.
Rhopala, iv. 163.
RHUS, i. 217.
Rhus, iv. 21.
Rhus andrieuxii, iv. 24.
—— *aromatica*, var., i. 219.
—— *aromatica*, iv. 24.
—— barclayi, i. 219.
—— ciliolata, i. 217.
—— copallina, i. 217.
—— crenatifolia, i. 217.
—— filicina, i. 217.
—— *filicina*, iv. 19.
—— juglandifolia, i. 217; iv. 24.
—— *lindeniana*, i. 217.
—— macrophylla, iv. 24.
—— metopium, iv. 98.
—— *metopium*, iv. 110.
—— microphylla, i. 218.
—— *microphylla*, iv. 140, 141.
—— mollis, i. 218.
—— pachyrrhachis, i. 218; iv. 24.
—— perniciosa, i. 218; iv. 25.
—— polyantha, i. 218.
—— *polyantha*, i. 175.

Rhus potentillæfolia, i. 218.
—— *potentillæfolia*, i. 180; iv. 21.
—— rubifolia, i. 218.
—— saxatilis, i. 218.
—— schiedeana, i. 219.
—— *schiedeana*, i. 220.
—— schmidelioides, i. 219; iv. 24.
—— sempervirens, iv. 24.
—— subcordata, i. 219.
—— terebinthifolia, i. 219.
—— toxicodendron, i. 219.
—— trilobata, i. 220.
—— virens, i. 220; iv. 24.
RHYNCHANTHERA, i. 415.
Rhynchanthera insignis, i. 415.
—— mexicana, i. 415.
RHYNCHOSIA, i. 310.
Rhynchosia albo-nitens, i. 288.
—— calycosa, i. 310.
—— caribæa, i. 310.
—— *caribæa*, i. 311.
—— discolor, i. 311.
—— erythrinoides, i. 311.
—— *grandiflora*, i. 312.
—— hirsuta, i. 311.
—— longeracemosa, i. 311.
—— *longeracemosa*, i. 310.
—— macrocarpa, i. 311; iv. 31.
—— menispermoides, i. 311.
—— *mexicana*, i. 311.
—— minima, i. 311; iv. 112.
—— phaseoloides, i. 311; iv. 31.
—— portobellensis, i. 312.
—— precatoria, i. 312.
—— *precatoria*, i. 311.
—— *punctata*, i. 311.
—— *reticulata*, i. 310, 311.
—— senna, i. 312.
—— *texana*, i. 312.
RHYNCHOSPORA, iii. 464.
Rhynchospora, iii. 458.
—— *adulta*, iii. 467.
—— aristata, iii. 464.
—— armerioides, iii. 465.
—— aurea, iii. 465.
—— barbata, iii. 465.
—— cephalotes, iii. 465; iv. 114.
—— *comata*, iv. 165.
—— eximia, iii. 465.
—— glauca, iii. 465.
—— *globosa*, iii. 467.
—— *gracilis*, iii. 465.
—— hoffmanni, iii. 466.
—— jubata, iii. 466.
—— kunthii, iii. 466.
—— *leucocephala*, iii. 457.
—— marginata, iii. 466.
Rhynchospora mexicana, iii. 466.
—— micrantha, iii. 466.
—— *nervosa*, iii. 457.
—— paniculifera, iii. 466.
—— polycephala, iii. 466.
—— polyphylla, iii. 467.
—— presliana, iii. 467.
—— *pubera*, iii. 458.
—— *punctata*, iii. 466.
—— pungens, iii. 467.
—— *pura*, iii. 457.
—— robusta, iii. 467.
—— sartoriana, iii. 467.
—— schaffneri, iii. 467.
—— schiedeana, iii. 467.
—— *stellata*, iii. 457.
—— tenuis, iii. 467.
—— *vahliana*, iii. 457.
—— vulcani, iii. 468.
Rhynchostele pygmæa, iii. 277.
Rhytidophyllum humboldtii, ii. 480.
—— *œrstedii*, ii. 480.
Rhytidostylis gracilis, i. 488.
Rhytiglossa, ii. 517.
—— *acuminata*, ii. 518.
—— *anagallis*, ii. 517.
—— *barbata*, ii. 517.
—— *breviflora*, ii. 517.
—— *candelariæ*, ii. 517.
—— *caracasana*, ii. 517.
—— *corymbulosa*, ii. 517.
—— *hyssopus*, ii. 518.
—— *inæqualis*, ii. 518.
—— *latifolia*, ii. 518.
—— *lindeniana*, ii. 518.
—— *mexicana*, ii. 518.
—— *microphylla*, ii. 517.
—— *nana*, ii. 518.
—— *pectoralis*, ii. 519.
—— *secunda*, ii. 519.
RIBES, i. 386.
Ribes, iv. 127, 166.
Ribes affine, i. 386.
—— aureum, i. 386.
—— *campanulatum*, i. 386.
—— *ciliatum*, i. 386.
—— *fragrans*, i. 386.
—— jorullense, i. 386.
—— *jorullense*, iv. 150, 285.
—— *kunthii*, i. 386.
—— microphyllum, i. 386.
—— *microphyllum*, iv. 285.
—— multiflorum, i. 386.
—— *odoratum*, i. 386.
—— *tenuiflorum*, i. 386.
RIBESIEÆ, i. 386.
Ricaurtea, i. 12.
Richardia, ii. 62.
RICHARDSONIA, ii. 62.
Richardsonia hænkeana, ii. 62.
—— pilosa, ii. 62.
—— scabra, ii. 62.
Ricinella, iii. 129.
—— *barbinervis*, iii. 129.
—— *myricæfolia*, iii. 122.
—— *oaxacana*, iii. 129.
—— *triloba*, iii. 130.
RICINUS, iii. 131.
Ricinus communis, iii. 131.
RIDDELLIA, ii. 211.
Riddellia, iv. 140.
Riddellia arachnoidea, ii. 211.
—— tagetina, ii. 211.
Riedleia, i. 130, 131, 132.
—— *heterotricha*, i. 130.
—— *serrata*, i. 130, 131.
—— *urticæfolia*, i. 131.
RIESENBACHIA, i. 466.
Riesenbachia racemosa, i. 466.
RIGIDELLA, iii. 327.
Rigidella flammea, iii. 327.
—— immaculata, iii. 327.
—— orthantha, iii. 327.
RIGIOSTACHYS, i. 173.
Rigiostachys, i. 13.
Rigiostachys bracteata, i. 173.
RIVINA, iii. 28.
Rivina brasiliensis, iii. 28.
—— *glabrata*, iii. 28.
—— humilis, iii. 28; iv. 107.
—— lævis, iv. 114.
—— *lævis*, iii. 28.
—— *lanceolata*, iii. 28.
—— *mexicana*, iii. 28.
—— *octandra*, iii. 29.
—— *orientalis*, iii. 28.
—— *purpurascens*, iii. 28.
—— *scandens*, iii. 29.
ROBINIA, i. 259.
Robinia, iv. 309.
Robinia acuminata, i. 259.
—— ehrenbergii, i. 259.
—— glabra, i. 259.
—— latifolia, i. 259.
—— maculata, i. 259.
—— melanocarpa, i. 259.
—— *melanocarpa*, iv. 27.
—— pyramidata, i. 259.
—— schiedeana, i. 259.
—— variegata, i. 259.
Robynsia lobata, i. 310.
—— *macrophylla*, i. 309.
RODRIGUEZIA, iii. 271.

Rodriguezia lanceolata, iii. 271.
—— leochilina, iii. 271.
—— *maculata*, iii. 289.
—— secunda, iii. 271.
—— *secunda*, iv. 270.
Rogiera, ii. 16.
—— *amœna*, ii. 17.
—— *cordata*, ii. 18.
—— *elegans*, ii. 23.
—— *elegantissima*, ii. 19.
—— *gratissima*, ii. 19.
—— *latifolia*, ii. 17.
—— *menechma*, ii. 17.
—— *roezlii*, ii. 23.
—— *rugosa*, ii. 17.
—— *versicolor*, ii. 17.
Rolandra, ii. 76.
Rolandra argentea, ii. 76.
Roldana lobata, ii. 246.
Rollinia, i. 18.
Rollinia mucosa, i. 18.
—— *sieberi*, i. 18.
Romualdea malpighifolia, i. 193.
Rondeletia, ii. 16.
Rondeletia, ii. 25; iv. 101, 163, 249.
Rondeletia affinis, ii. 16.
—— *affinis*, ii. 25.
—— amœna, ii. 16.
—— *amœna*, ii. 20, 25.
—— buddleoides, ii. 17.
—— *buddleoides*, ii. 25.
—— capitellata, ii. 17.
—— *capitellata*, ii. 25.
—— cordata, ii. 18.
—— *cordata*, ii. 20, 25.
—— *cornifolia*, ii. 26.
—— dubia, ii. 18.
—— *dubia*, ii. 25.
—— elongata, ii. 18.
—— *elongata*, ii. 25.
—— *eriantha*, ii. 23.
—— gracilis, ii. 19.
—— *gracilis*, ii. 25.
—— gratissima, ii. 19.
—— *gratissima*, ii. 25.
—— intermedia, ii. 19.
—— *intermedia*, ii. 25.
—— jurgensenii, ii. 20.
—— *jurgensenii*, ii. 25.
—— laniflora, ii. 20.
—— *laniflora*, ii. 16, 25.
—— leucophylla, ii. 21.
—— *leucophylla*, ii. 18, 19, 25.
—— ligustroides, ii. 21.
—— *ligustroides*, ii. 25.
—— linguiformis, ii. 21.
—— *linguiformis*, ii. 25.
Rondeletia macrophylla, ii. 17.
—— nicaraguensis, ii. 22.
—— *nicaraguensis*, ii. 25.
—— nitida, ii. 22.
—— *nitida*, ii. 25.
—— odorata, ii. 22.
—— *odorata*, ii. 25.
—— panamensis, ii. 23.
—— *panamensis*, ii. 25.
—— *pilosa*, ii. 23.
—— *pubescens*, ii. 19.
—— roezlii, ii. 23.
—— *roezlii*, ii. 25.
—— scabra, ii. 23.
—— *scabra*, ii. 25.
—— *speciosa*, ii. 22.
—— stenosiphon, ii. 24.
—— *stenosiphon*, ii. 25.
—— strigosa, ii. 24.
—— *strigosa*, ii. 25.
—— *versicolor*, ii. 17.
—— villosa, ii. 24.
—— *villosa*, ii. 16, 25.
RONDELETIEÆ, ii. 15.
Rosa, i. 379.
Rosa, i. 365; iv. 240.
Rosa blanda, i. 379.
—— *blanda*, iv. 34.
—— *canina*, i. 379; iv. 35.
—— fendleri, iv. 34.
—— mexicana, iv. 34.
—— montezumæ, i. 379.
—— *montezumæ*, iv. 35.
ROSACEÆ, i. 365; iv. 33.
Rosaceæ, i. 173; iv. 166, 179, 202, 215, 217, 225, 230, 234, 240.
Rosalesia glandulosa, ii. 106.
Rosea elatior, iii. 21.
ROSEÆ, i. 379.
Rosenbergia gracilis, ii. 357.
Rosilla, ii. 210.
Rosilla lutea, ii. 210.
Rotala, i. 435.
Rotala mexicana, i. 435.
—— ramosior, i. 435.
Rothrockia, iv. 70.
Rothrockia cordifolia, iv. 70.
Rottboellia, iii. 521.
Rottboellia compressa, iii. 509.
—— glabrata, iii. 521.
—— ramosa, iii. 521.
—— *stigmosa*, iii. 521.
Roulinia, ii. 328.
Roulinia, iii. 371.
—— *acrotricha*, iii. 373.
—— *gracilis*, iii. 373.
—— humboldtiana, iii. 372.
Roulinia jacquini, iii. 329.
—— *karwinskiana*, iii. 372.
—— *longifolia*, iii. 371.
—— palmeri, iv. 70.
—— unifaria, ii. 329.
—— *unifaria*, iv. 70.
Roupala, iii. 77.
Roupala, iv. 234, 314.
Roupala adiantifolia, iii. 78.
—— borealis, iii. 78.
—— complicata, iii. 78.
—— loranthoides, iii. 78.
—— martii, iii. 78.
—— pinnata, iii. 78.
—— simplicifolia, iii. 78.
Rourea, i. 224.
Rourea frutescens, i. 224.
—— glabra, i. 224; iv. 111.
—— oblongifolia, i. 224.
Roxburghiaceæ, iii. 362; iv. 197.
RUBEÆ, i. 370.
Rubia acuminata, ii. 66.
—— *ciliata*, ii. 62.
—— *hypocarpia*, ii. 63.
—— *lævigata*, ii. 63.
RUBIACEÆ, ii. 6; iv. 47, 101.
Rubiaceæ, iv. 182, 202, 215, 217, 225, 229, 231, 234, 248.
Rubus, i. 370.
Rubus, i. 365; iv. 147, 149, 150, 158, 166, 240, 262.
Rubus adenotrichus, i. 371.
—— coriifolius, i. 371.
—— costa-ricanus, i. 371.
—— *dumetorum*, i. 372.
—— eriocarpus, i. 371.
—— fagifolius, i. 371.
—— *flagellaris*, i. 373.
—— floribundus, i. 371.
—— *humifusus*, i. 371.
—— humistratus, i. 371.
—— *humistratus*, iv. 34.
—— irasuensis, i. 371.
—— *irasuensis*, iv. 158.
—— jamaicensis, i. 371.
—— liebmannii, i. 371.
—— miser, i. 372.
—— *neomexicanus*, i. 373.
—— occidentalis, i. 372.
—— *occidentalis*, iv. 284.
—— pumilus, i. 372.
—— rosæfolius, i. 372.
—— sapidus, i. 372.
—— scandens, i. 372.
—— schiedeanus, i. 372.
—— strigosus, i. 372.
—— *tiliaceus*, i. 372.

Rubus tiliæfolius, i. 372.
—— trichomallus, i. 372.
—— trilobus, i. 372.
—— *trilobus*, iv. 284.
—— trivialis, i. 373; iv. 34.
—— uhdeanus, i. 373.
—— urticæfolius, i. 373.
—— *urticæfolius*, i. 372; iv. 167.
—— villosus, i. 373.
Rudbeckia, ii. 167.
Rudbeckia alata, ii. 228.
—— columnaris, ii. 167.
Rudolphia dubia, i. 294.
Ruellia, ii. 503.
Ruellia acaulis, ii. 506.
—— achimeniflora, ii. 503.
—— albicaulis, ii. 503.
—— *angustifolia*, ii. 508.
—— bourgæi, ii. 504.
—— campestris, ii. 504.
—— *clandestina*, ii. 507.
—— *concavifolia*, ii. 504.
—— densiflora, ii. 504.
—— dipteracanthus, ii. 504.
—— *dulcis*, ii. 510.
—— *fœtida*, ii. 507.
—— geminiflora, ii. 505.
—— gemmipara, ii. 504.
—— *gigantea*, ii. 509.
—— hirsuto-glandulosa, ii. 505.
—— hookeriana, ii. 505.
—— humifusa, ii. 505.
—— hygrophiloides, ii. 505.
—— jussieuoides, ii. 505.
—— lactea, ii. 505.
—— *lacustris*, ii. 501.
—— lanato-viscosa, ii. 506.
—— longepetiolata, ii. 506.
—— macrophylla, ii. 506.
—— *microphylla*, ii. 503.
—— *ocymoides*, ii. 504.
—— ovalifolia, ii. 506.
—— *ovata*, ii. 503.
—— paniculata, ii. 506.
—— parva, ii. 506.
—— *parviflora*, ii. 506.
—— pilosa, ii. 506.
—— *pilosa*, ii. 507.
—— pulcherrima, ii. 507.
—— *pulcherrima*, ii. 504.
—— *quitensis*, ii. 503.
—— *rivularis*, ii. 502.
—— rosea, ii. 507.
—— rubicaulis, ii. 507.
—— schlechtendaliana, ii. 507.
—— stemonacanthoides, ii. 507.
—— subcapitata, ii. 507.
Ruellia tuberosa, ii. 507.
—— tubiflora, ii. 507.
—— *tubiflora*, ii. 505.
—— tweediana, ii. 508.
Rumex, iii. 35.
Rumex, iv. 259.
Rumex berlandieri, iii. 35; iv. 84.
—— brevipes, iii. 35.
—— chrysocarpus, iii. 35.
—— crispus, iii. 35; iv. 84.
—— ——, var. mexicanus, iii. 35.
—— kunthianus, iii. 35.
—— *longifolius*, iii. 35.
—— maritimus, iii. 35.
—— mexicanus, iii. 35; iv. 84.
Rumfordia, ii. 157.
Rumfordia floribunda, ii. 157.
Ruppia, iv. 93.
Ruppia, iii. 440.
Ruppia maritima, iv. 93.
Ruprechtia, iii. 38.
Ruprechtia, iv. 259.
—— *costata*, iii. 38.
—— cumingii, iii. 38.
Russelia, ii. 446.
Russelia ephedroides, ii. 447.
—— equisetiformis, ii. 446.
—— *floribunda*, ii. 446.
—— juncea, ii. 446.
—— *multiflora*, ii. 446.
—— *paniculata*, ii. 446.
—— *polyedra*, ii. 446.
—— rotundifolia, ii. 446.
—— sarmentosa, ii. 446; iv. 105, 113.
—— *syringæfolia*, ii. 446.
—— *ternifolia*, ii. 446.
—— verticillata, ii. 447.
Rustia, ii. 14.
Rustia occidentalis, ii. 14.
RUTACEÆ, i. 166; iv. 17, 97.
Rutaceæ, iv. 176, 203, 214, 216, 224, 230, 238.
RUTEÆ, i. 167.
Rutosma texana, i. 167.
Ruyschia, i. 91.
Ruyschia, iv. 301.
—— *bicolor*, i. 92.
—— lepidota, i. 92.
—— mexicana, i. 92; iv. 13.
—— *pavonii*, iv. 13.
Rytidoloma reticulatum, ii. 329.

Sabadilla officinarum, ii. 383.
Sabal, iii. 410.
Sabal, iv. 152, 277.
Sabal mexicana, iii. 410.
Sabal palmetto, iii. 410.
Sabazia, ii. 160.
Sabazia humilis, ii. 160.
—— microglossa, ii. 160.
—— puberula, ii. 160.
—— sarmentosa, ii. 160.
—— *sarmentosa*, iv. 288.
—— urticæfolia, ii. 161.
Sabbatia, ii. 347.
Sabbatia maculata, ii. 347.
SABIACEÆ, i. 216.
Sabiaceæ, iv. 177, 205, 229.
Sabicea, ii. 33.
Sabicea, iv. 231, 249.
—— *edulis*, ii. 33.
—— glabrescens, ii. 33.
—— hirsuta, ii. 33.
—— hirta, ii. 33.
Sabina flaccida, iii. 184.
—— *mexicana*, iii. 184.
—— *tetragona*, iii. 184.
Sabinea, i. 261.
Sabinea florida, i. 261.
Saccharum, iii. 519.
Saccharum cayennensis, iii. 519.
—— *contractum*, iii. 519.
—— *dubium*, iii. 519.
—— *giganteum*, iii. 520.
—— *mexicanum*, iii. 520.
—— officinarum, iii. 520.
—— *polystachyum*, iii. 482, 519.
—— *sagittatum*, iii. 571.
Saccoloma elegans, iii. 605.
Saccoplectus strigosus, ii. 48[illegible].
Sadleria, iii. 627.
Sagenia athyrioides, iii. 644.
—— cicutarium, iii. 645.
—— macrophylla, iii. 648.
—— *mexicana*, iii. 645.
Sageretia, i. 200.
Sageretia, iv. 229.
Sageretia elegans, i. 200.
—— michauxii, i. 200.
—— *michauxii*, iv. 22.
—— wrightii, iv. 22.
Sagina, i. 71.
Sagina linnæi, i. 71; iv. 11.
—— mexicana, i. 71.
—— procumbens, i. 71.
Sagittaria, iii. 438.
Sagittaria acutifolia, iii. 438.
—— *angustifolia*, iii. 438.
—— *echinocarpa*, iii. 438.
—— graminea, iii. 438.
—— guyanensis, iii. 438.
—— lancifolia, iii. 438.
—— macrophylla, iii. 438.

Sagittaria mexicana, iii. 439.
—— *mexicana*, iii. 438.
—— *ovata*, iii. 438.
—— *plantaginifolia*, iii. 438.
—— *purshii*, iii. 438.
—— *radicans*, iii. 439.
—— sagittifolia, iii. 439.
—— *sellowiana*, iii. 438.
—— *stolonifera*, iii. 438.
Sagotia triflora, i. 290.
SAGRÆA, i. 431.
Sagræa columneæfolia, i. 431.
—— petiolata, i. 431.
—— rubra, i. 431.
—— *rubra*, iv. 242.
—— *scabrosa*, i. 432.
—— *sessiliflora*, i. 431.
SAHAGUNIA, iii. 149.
Sahagunia mexicana, iii. 149.
SALACIA, i. 194.
Salacia, i. 192.
—— *grandiflora*, iv. 111.
—— *pruinosa*, i. 194.
—— scandens, i. 194.
Salazaria, ii. 568.
SALICINEÆ, iii. 179; iv. 88.
Salicineæ, iv. 194, 204, 226.
Salisia, ii. 473.
SALIX, iii. 179.
Salix bonplandiana, iii. 179.
—— *bonplandiana*, iv. 294.
—— cana, iii. 179.
—— *cana*, iv. 294.
—— *caprea*, iv. 149.
—— *falcata*, iii. 179.
—— hartwegi, iii. 180.
—— *hartwegi*, iv. 294.
—— humboldtiana, iii. 179.
—— *humilis*, iii. 180.
—— latifolia, iii. 180.
—— *latifolia*, iv. 294.
—— *microphylla*, iii. 180.
—— nigra, iii. 180.
—— *oxyphylla*, iii. 179.
—— pallida, iii. 179.
—— paradoxa, iii. 180.
—— *paradoxa*, iv. 294.
—— *purpurea*, iv. 149.
—— stipulacea, iii. 180.
—— taxifolia, iii. 180.
—— wrightii, iii. 180.
SALIZARIA, ii. 568.
Salizaria mexicana, ii. 568.
SALMEA, ii. 194.
Salmea angustifolia, ii. 194.
—— *curviflora*, ii. 191.
—— *eupatoria*, ii. 194.
Salmea grandiceps, ii. 194.
—— oligocephala, ii. 194.
—— *scandens*, ii. 194.
Salpianthus, ii. 7, 8.
Salpianthus arenarius, iii. 8.
—— *purpurascens*, iii. 8.
SALSOLA, iii. 217.
Salsola kali, iii. 217.
Salutiæa grandiflora, ii. 474.
Salvadoraceæ, iv. 186.
SALVIA, ii. 552.
Salvia, iv. 147, 149, 150, 163, 166, 212, 258.
—— *acuminata*, ii. 553.
—— affinis, ii. 552.
—— agglutinans, ii. 552.
—— albiflora, ii. 552.
—— albo-cærulea, iv. 80.
—— alvayaca, ii. 552.
—— *amara*, ii. 553.
—— amarissima, ii. 553.
—— angustifolia, ii. 552.
—— aristulata, ii. 553.
—— aspera, ii. 553.
—— *aspidophylla*, ii. 559.
—— assurgens, ii. 553.
—— axillaris, ii. 553.
—— azurea, ii. 553.
—— ballotæflora, ii. 553.
—— *betonica*, ii. 556.
—— biserrata, ii. 553.
—— *biserrata*, iv. 292.
—— *bracteata*, ii. 557.
—— brevicalyx, ii. 553.
—— *brevicalyx*, iv. 292.
—— breviflora, ii. 554.
—— *bullata*, ii. 561.
—— bupleuroides, ii. 554.
—— cacaliæfolia, ii. 554.
—— *cæsia*, ii. 563.
—— candicans, ii. 554.
—— capitata, ii. 554.
—— *cardinalis*, ii. 556.
—— *chamædrifolia*, ii. 554.
—— chamædryoides, ii. 554.
—— *chamædrys*, ii. 554.
—— chrysantha, ii. 554.
—— *chrysantha*, iv. 292.
—— *ciliata*, ii. 555, 557.
—— cinnabarina, ii. 554.
—— *circinata*, ii. 553.
—— clinopodioides, ii. 554.
—— coccinea, ii. 555.
—— *coccinea*, iv. 292.
—— comosa, ii. 555.
—— *comosa*, iv. 292.
—— concolor, ii. 555.
Salvia costaricensis, ii. 555.
—— crenata, ii. 555.
—— *cryptanthos*, ii. 557.
—— cuneifolia, ii. 555.
—— curviflora, ii. 555.
—— cyanea, ii. 555.
—— *cyanifera*, ii. 555.
—— *decipiens*, ii. 562.
—— *deltoides*, ii. 564.
—— elegans, ii. 555.
—— *elegans*, iv. 292.
—— elongata, ii. 556.
—— *elongata*, ii. 563.
—— *elscholtzioides*, ii. 558.
—— excelsa, ii. 556.
—— *farinosa*, ii. 564.
—— filipes, ii. 556.
—— *fimbriata*, ii. 566.
—— flexuosa, ii. 556.
—— *foliosa*, ii. 564.
—— fruticulosa, ii. 556.
—— fulgens, ii. 556.
—— *fulgens*, iv. 292.
—— *galeottii*, ii. 555.
—— glabra, ii. 556.
—— glabrata, ii. 556.
—— *glaucescens*, ii. 555.
—— glechomæfolia, ii. 556; iv. 80.
—— *glechomæfolia*, iv. 292.
—— glumacea, ii. 556.
—— graciliflora, ii. 557.
—— gracilis, ii. 557.
—— grahami, ii. 557.
—— *grandiflora*, ii. 562.
—— greggii, ii. 557; iv. 81.
—— helianthemifolia, ii. 557.
—— henryi, ii. 557.
—— herbacea, ii. 557.
—— *herbacea*, iv. 292.
—— hirsuta, ii. 557.
—— *hirta*, ii. 565.
—— hispanica, ii. 558.
—— *humboldtiana*, ii. 559, 565.
—— *humboldtii*, ii. 565.
—— humilis, ii. 558.
—— hyptoides, ii. 558.
—— ianthina, ii. 558.
—— incana, ii. 558.
—— *incarnata*, ii. 555.
—— inconspicua, ii. 558.
—— involucrata, ii. 558.
—— karwinskii, ii. 558.
—— keerlii, ii. 559.
—— *lævigata*, ii. 558.
—— lævis, ii. 559.
—— *lanceæfolia*, ii. 559.
—— lanceolata, ii. 559.

Salvia lantanæfolia, ii. 559.
—— lasiantha, ii. 559.
—— lasiocephala, ii. 559.
—— *lavandulæfolia*, ii. 559.
—— lavanduloides, ii. 559.
—— *laxa*, ii. 553.
—— lemmoni, iv. 81.
—— leonia, ii. 559.
—— leptophylla, ii. 560.
—— leptostachys, ii. 560.
—— leucantha, ii. 560.
—— lindenii, ii. 560.
—— *linearifolia*, ii. 563.
—— lineata, ii. 560.
—— linifolia, ii. 560.
—— *linifolia*, iv. 292.
—— littæ, ii. 560
—— *littæ*, iv. 81.
—— *longiflora*, ii. 566.
—— longispicata, ii. 560.
—— longistyla, ii. 560.
—— lophantha, ii. 560.
—— *macrantha*, ii. 562.
—— madrensis, ii. 560.
—— martensii, ii. 560.
—— *martensii*, iv. 292.
—— *melissæfolia*, ii. 561.
—— *melissodora*, ii. 565.
—— membranacea, ii. 560.
—— mexicana, ii. 561.
—— *mexicana*, ii. 553.
—— micrantha, ii. 561.
—— *micrantha*, iv. 233.
—— microcalyx, ii. 561.
—— microphylla, ii. 561.
—— *microphylla*, ii. 557.
—— misella, ii. 561.
—— moçinoi, ii. 561.
—— mollissima, ii. 561.
—— nana, ii. 561.
—— *nana*, iv. 292.
—— *nepetæfolia*, ii. 557.
—— *nepetoides*, ii. 553.
—— nervata, ii. 561.
—— *nervata*, iv. 292.
—— nitida, ii. 562.
—— oblongifolia, ii. 562.
—— *oblongifolia*, iv. 292.
—— obtusa, ii. 562.
—— occidentalis, ii. 562.
—— *occidentalis*, iv. 233.
—— orbicularis, ii. 562.
—— parquerensis, ii. 562.
—— patens, ii. 562.
—— *patens*, iv. 292.
—— pauciflora, ii. 563.
—— *pazcuarensis*, ii. 562.
Salvia phlomoides, ii. 557.
—— polystachya, ii. 563.
—— *polystachya*, ii. 556, 566.
—— porphyrata, ii. 563.
—— *porphyrata*, ii. 564.
—— prasiifolia, ii. 563.
—— *prismatica*, ii. 558.
—— privoides, ii. 563.
—— *procumbens*, ii. 562.
—— protracta, ii. 563.
—— *proxima*, ii. 566.
—— prunelloides, ii. 563 ; iv. 80.
—— *prunelloides*, ii. 561.
—— *pseudococcinea*, ii. 555.
—— pubescens, ii. 563.
—— pulchella, ii. 563.
—— *pulchella*, ii. 565.
—— *punicea*, ii. 555.
—— purpurascens, ii. 564.
—— *purpurascens*, iv. 292.
—— purpurea, ii. 564.
—— *radicans*, ii. 562.
—— rectiflora, ii. 564.
—— recurva, ii. 564.
—— *reflexa*, ii. 559.
—— regla, ii. 564.
—— remota, ii. 564.
—— *reptans*, ii. 552.
—— reticulata, ii. 564.
—— *reticulata*, iv. 292.
—— rhombifolia, ii. 564.
—— rœmeriana, ii. 564.
—— roezlii, iv. 81.
—— *rosea*, ii. 555.
—— rubiginosa, ii. 565.
—— *saligna*, ii. 565.
—— sanctæ-luciæ, ii. 565.
—— scorodoniæfolia, ii. 565.
—— semiatrata, ii. 565.
—— serotina, iv. 107, 113.
—— *serotina*, ii. 561.
—— sessei, ii. 565.
—— sidæfolia, ii. 565.
—— *sideritidis*, ii. 557.
—— *simplex*, ii. 556.
—— *spectabilis*, ii. 562.
—— spicata, ii. 565.
—— stachyoides, ii. 565.
—— *staminea*, ii. 562.
—— stolonifera, ii. 565.
—— *stolonifera*, iv. 292.
—— subincisa, ii. 565.
—— *tetragona*, ii. 558.
—— thymoides, ii. 566.
—— thyrsiflora, ii. 566.
—— tiliæfolia, ii. 566.
—— *tiliæfolia*, iv. 233.
Salvia trichostemoides, ii. 559.
—— tricolor, iv. 81.
—— tricuspidata, ii. 566.
—— *tricuspidata*, iv. 292.
—— *tubæformis*, ii. 564.
—— tubifera, ii. 566.
—— *tubifera*, iv. 81.
—— *virgata*, ii. 552.
—— vitifolia, ii. 566.
—— warscewicziana, ii. 566.
—— xalapensis, ii. 566.
SALVIASTRUM, ii. 566.
Salviastrum texanum, ii. 567.
SALVINIA, iii. 710.
Salvinia auriculata, iii. 710.
—— *hispida*, iii. 710.
—— *rotundifolia*, iii. 710.
SAMBUCUS, ii. 1.
Sambucus, iv. 110, 248.
Sambucus bipinnata, ii. 1.
—— *bipinnata*, iv. 147.
—— canadensis, ii. 1.
—— *glauca*, ii. 1.
—— mexicana, ii. 1 ; iv. 101.
Samodia ebracteata, ii. 289.
SAMOLUS, ii. 289.
Samolus ebracteatus, ii. 289.
SAMYDA, i. 470.
Samyda icosandra, i. 469.
—— macrocarpa, i. 470.
—— rubra, i. 470.
—— *serrulata*, i. 470.
SAMYDACEÆ, i. 468 ; iv. 38.
Samydaceæ, iv. 180, 204.
SANICULA, i. 563.
Sanicula liberta, i. 563.
—— *liberta*, iv. 149.
—— mexicana, i. 563.
—— *mexicana*, iv. 286.
SANICULEÆ, i. 560.
SANTALACEÆ, iii. 87.
Santalaceæ, iv. 192, 205, 217, 226.
SANVITALIA, ii. 154.
Sanvitalia, ii. 156.
Sanvitalia acapulcensis, ii. 154.
—— acinifolia, ii. 155.
—— angustifolia, ii. 155 ; iv. 55.
—— fruticosa, ii. 155.
—— ocymoides, ii. 155.
—— procumbens, ii. 155.
—— tragiæfolia, ii. 155.
—— *villosa*, ii. 155.
SAPINDACEÆ, i. 205 ; iv. 23.
Sapindaceæ, iv. 177, 202, 215, 217, 225, 229, 230.
SAPINDEÆ, i. 205.
SAPINDUS, i. 214.

Sapindus divaricatus, i. 214; iv. 111.
—— drummondii, i. 214.
—— *glabrescens*, i. 181.
—— inæqualis, i. 214.
—— marginatus, i. 214.
Sapium, iii. 136.
Sapium acutifolium, iii. 135.
—— *annuum β. bidentatum*, iii. 136.
—— biglandulosum, iii. 136.
—— klotzschianum, iii. 136.
—— moritzianum, iii. 136.
—— pavonianum, iii. 136.
—— zelayense, iii. 135.
Sapota, iv. 154.
—— *achras*, ii. 297.
SAPOTACEÆ, ii. 295; iv. 67, 104.
Sapotaceæ, iv. 186, 204, 215, 217, 234.
Sapranthus, i. 14.
Sapranthus, i. 17; iv. 96.
Sapranthus nicaraguensis, i. 14.
—— *nicaraguensis*, iv. 96.
Saracha, ii. 421.
Saracha allogona, ii. 421.
—— *angulata*, ii. 421.
—— conspersa, ii. 421.
—— *diffusa*, ii. 422.
—— *geniculata*, ii. 419.
—— glabrata, ii. 421.
—— *glabrata*, iv. 75.
—— jaltomata, ii. 422.
—— *jaltomata*, iv. 75.
—— laxa, ii. 422.
—— *laxa*, iv. 291.
—— *miersii*, ii. 422.
—— umbellata, ii. 422; iv. 75.
—— *umbellata*, iv. 291.
—— *viscosa*, ii. 422.
Sarcinanthus utilis, iii. 416.
Sarcostemma bicolor, ii. 318.
—— *bilobum*, ii. 318.
—— *crassifolium*, ii. 318.
—— *crispum*, ii. 318.
—— *cumanense*, ii. 318.
—— *cynanchoides*, ii. 318.
—— *elegans*, ii. 318.
—— *heterophyllum*, ii. 319.
—— *lindenianum*, ii. 318.
—— *lineare*, ii. 319.
—— *luridum*, ii. 319.
—— *pannosum*, ii. 320.
—— *rotundifolium*, ii. 320.
Sarmentaria decora, i. 421.
Sarotheca rostrata, ii. 515.
—— *salviæflora*, ii. 515.
Sarracenia, i. 26.
SARRACENIACEÆ, i. 26.
Sarraceniaceæ, iv. 172.
Sarratia berlandieri, iii. 14.
—— *scariosa*, iii. 14.
Sartwellia, ii. 215.
Sartwellia flaveriæ, ii. 215.
—— mexicana, iv. 59.
Sassafridium, iii. 75.
Sassafridium veraguense, iii. 75.
Satyria, ii. 272.
Satyria, iv. 254.
Satyria clonantha, ii. 272.
—— warscewiczii, ii. 272; iv. 66.
Satyrium vallisoletanum, iv. 89.
Saurauja, i. 93.
Saurauja angustifolia, i. 94.
—— anisopoda, i. 94.
—— aspera, i. 194.
—— *barbigera*, i. 94.
—— kegeliana, iv. 95.
—— latipetala, i. 94.
—— leucocarpa, i. 94.
—— *leucocarpa*, i. 95.
—— macrophylla, i. 94.
—— *montana*, i. 96.
—— *obelanthera*, i. 96.
—— oreophila, i. 94.
—— *oreophila*, iv. 283.
—— pauciserrata, i. 95.
—— pedunculata, i. 95.
—— *pedunculata*, i. 96.
—— rubiformis, iv. 13.
—— scabrida, i. 95.
—— serrata, i. 96.
—— *serrata*, i. 95.
—— veraguensis, i. 96.
—— villosa, i. 96.
—— *villosa*, i. 94.
SAURAUJEÆ, i. 93.
Saurureæ, iv. 226.
Sauvagesia, i. 54.
Sauvagesia erecta, i. 54.
—— *geminiflora*, i. 54.
—— pulchella, i. 54.
—— *pulchella*, iv. 165.
—— tenella, i. 54.
SAUVAGESIEÆ, i. 54.
Saxifraga, i. 381.
SAXIFRAGACEÆ, i. 381; iv. 35.
Saxifragaceæ, iv. 179, 204, 215, 217, 225, 229, 240.
SAXIFRAGEÆ, i. 381.
Scævola, ii. 263.
Scævola lobelia, ii. 263.
—— plumieri, iv. 113.
—— *plumieri*, ii. 263.
Scaphyglottis, iii. 219.
Scaphyglottis behrii, iii. 219.
Scaphyglottis dubia, iii. 219.
—— fasciculata, iii. 219.
—— *fasciculata*, iii. 220.
—— kienastii, iii. 219.
—— mesocopis, iii. 220.
Schædonnardus, iii. 560.
Schæfferia, i. 190.
Schæfferia cuneifolia, i. 190.
—— frutescens, i. 190.
—— racemosa, i. 190.
—— *viridescens*, i. 190.
Schætzellia, ii. 84.
Schætzellia deckerii, ii. 254.
—— mexicana, ii. 84.
Schaffnera, iii. 518.
Schaffnera, iv. 279.
Schaffnera gracilis, iii. 518.
Schaffneria nigripes, iii. 641.
—— *nigripes*, iii. 641.
Schaueria parvifolia, ii. 519.
Scheeria lanata, ii. 475.
—— *mexicana*, ii. 476.
—— *panamensis*, ii. 475.
Schellingia, iii. 516.
—— *tenera*, iii. 517.
Schenodorus lividus, iii. 582.
Schilleria aurita, iii. 45.
—— *caudata*, iii. 50.
—— *corylifolia*, iii. 48.
—— *grandifolia*, iii. 49.
—— *karwinskiana*, iii. 49.
—— *lapathifolia*, iii. 50.
—— *leptura*, iii. 50.
—— *lineata*, iii. 50.
—— *lucæna*, iii. 50.
—— *macrophylla*, iii. 50.
—— *marginata*, iii. 50.
—— *melastomoides*, iii. 51.
—— *oblonga*, iii. 52.
—— *ulmifolia*, iii. 48.
Schinus, i. 221.
Schinus molle, i. 221.
Schistocarpha, ii. 233.
Schistocarpha bicolor, ii. 233.
Schistophragma pusilla, ii. 451.
Schizachyrium brevifolium, iii. 526.
—— *condensatum*, iii. 526.
—— *hirtiflorum*, iii. 528.
—— *myosurus*, iii. 528.
—— *tenerum*, iii. 529.
Schizæa, iii. 692.
Schizæa elegans, iii. 692.
Schizæaceæ, iii. 692.
Schizocarpum, i. 492.
Schizocarpum filiforme, i. 493.
—— liebmannii, iv. 40.
Schizolepis panicoides, iii. 470.

SCHIZOLOBIUM, i. 326.
SCHKUHRIA, ii. 212.
Schkuhria abrotanoides, ii. 212.
—— biternata, ii. 212.
—— hopkirkia, ii. 212.
—— senecioides, ii. 212.
—— virgata, ii. 212.
—— wislizenii, ii. 213.
—— wrightii, ii. 213.
Schlechtendalia glandulosa, ii. 218.
SCHMIDELIA, i. 211.
Schmidelia cominia, i. 211.
—— glabrata, i. 211.
—— *inæquilatera*, i. 211.
—— occidentalis, i. 211.
—— *semidentata*, i. 211.
—— *sericea*, i. 211.
Schnella excisa, i. 337.
—— hymenææfolia, i. 337.
—— *splendens*, i. 340.
SCHŒNOCAULON, iii. 382.
Schœnocaulon coulteri, iii. 382.
—— drummondii, iii. 382.
—— intermedium, iii. 382.
—— officinale, iii. 383.
—— *texanum*, iii. 382.
Schœnolirion, iii. 374.
Schœnoprasum longifolium, iii. 378.
—— *lineare*, iii. 378.
Schœnus barbatus, iii. 465.
—— *cephalotes*, iii. 465.
—— *longifolius*, iii. 468.
—— *mariscus*, iii. 468.
—— *surinamensis*, iii. 465.
SCHŒPFIA, i. 185.
Schœpfia, iv. 229.
Schœpfia angulata, i. 185.
—— arborescens, i. 185.
—— mexicana, i. 185.
—— parvifolia, i. 186.
—— vacciniiflora, i. 186.
Schollera graminea, iii. 384.
—— *graminifolia*, iii. 384.
SCHOMBURGKIA, iii. 247.
Schomburgkia galeottiana, iii. 247.
—— *galeottiana*, iv. 303.
—— *tibicina*, iv. 152.
—— tibicinis, iii. 247.
—— *tibicinis*, iv. 300.
—— ——, var. *grandiflora*, iii. 247.
SCHRANKIA, i. 350.
Schrankia aculeata, i. 350; iv. 33.
—— *brachycarpa*, i. 348.
—— distachya, i. 351.
—— *elata*, i. 347.
—— leptocarpa, i. 351.
—— subinermis, iv. 33.
Schrankia uncinata, i. 351.
Schubertia tristis, ii. 321.
SCHULTESIA, ii. 347.
Schultesia brachyptera, ii. 347.
—— heterophylla, ii. 348.
—— lisianthoides, ii. 348.
—— stenophylla, ii. 348.
SCHWEIGGERA, i. 49.
Schweiggera mexicana, i. 49.
Sciadoceris vaginata, ii. 237.
SCIADODENDRON, i. 575.
Sciadodendron excelsum, i. 557.
Sciadophyllum guatemalense, i. 573.
SCILLEÆ, iii. 379.
Scirpidium sulcatum, iii. 475.
SCIRPUS, iii. 460.
Scirpus, iii. 461.
—— *acicularis*, iii. 454.
—— *autumnalis*, iii. 458.
—— berlandieri, iii. 460.
—— *capillaris*, iii. 459.
—— *corymbosus*, iii. 465.
—— cubensis, iii. 461.
—— *cubensis*, iv. 232.
—— *cyperinus*, iii. 462.
—— cyperoides, iii. 461.
—— *eriophorus*, iii. 462.
—— heterocarpus, iii. 461.
—— lacustris, iii. 461.
—— *maritimus*, iii. 462.
—— melanocarpus, iii. 461.
—— *micranthus*, iii. 463.
—— olneyi, iii. 461.
—— parvulus, iii. 461.
—— pseudo-junciformis, iii. 461.
—— pungens, iii. 462.
—— *retroflexus*, iii. 455.
—— riparius, iii. 462.
—— schaffneri, iv. 93.
—— *subsquarrosus*, iii. 463.
—— supinus, iii. 462.
—— *tenuifolius*, iii. 459.
—— tenuispicatus, iii. 462.
—— *validus*, iii. 461.
—— *vestitus*, iii. 460.
SCITAMINEÆ, iii. 308; iv. 90.
Scitamineæ, iv. 196, 203, 217, 231.
Sclarea mexicana, ii. 561.
SCLERIA, iii. 468.
Scleria anceps, iii. 468.
—— asperrima, iii. 469.
—— bourgeaui, iii. 469.
—— bracteata, iii. 469; iv. 114.
—— *bracteata*, iii. 471.
—— *communis*, iii. 470.
—— coriacea, iii. 469.
—— elongata, iii. 469.
Scleria flagellum, iii. 470.
—— foveolata, iii. 469.
—— hirta, iii. 469.
—— hirtella, iii. 469.
—— *hirtella*, iv. 232.
—— *homonyma*, iii. 471.
—— *laxa*, iii. 471.
—— liebmannii, iii. 469.
—— macrocarpa, iii. 470.
—— melaleuca, iii. 470.
—— mexicana, iii. 470.
—— micrococca, iii. 470.
—— mitis, iii. 470.
—— *mollis*, iii. 469.
—— *muehlenbergiana*, iii. 471.
—— nutans, iii. 469.
—— *nutans*, iv. 165.
—— *palmifolia*, iii. 470.
—— panicoides, iii. 470.
—— pratensis, iii. 470.
—— purpureozonata, iii. 470.
—— reflexa, iii. 470.
—— scabriuscula, iii. 471.
—— *schiedeana*, iii. 471.
—— setulosociliata, iii. 471.
—— torreyana, iii. 471.
—— verticillata, iii. 471.
SCLEROCALYX, ii. 509.
Sclerocalyx mexicana, ii. 509.
SCLEROCARPUS, ii. 164.
Sclerocarpus dentatus, ii. 164.
—— divaricatus, ii. 164.
—— kerberi, iv. 56.
—— schiedeanus, ii. 164.
—— uniserialis, ii. 164.
SCLEROLOBIEÆ, i. 323.
Scleroon oleinum, ii. 539.
SCLEROPOGON, iii. 570.
Scleropogon, iv. 279, 309.
Scleropogon brevifolius, iii. 570.
—— *karwinskyanus*, iii. 570.
Scleropus amarantoides, iii. 14.
—— *crassipes*, iii. 14.
SCLEROTHRIX, i. 472.
Sclerothrix fasciculata, i. 472.
Scoliosorus ensiformis, iii. 680.
SCOLOPENDRIEÆ, iii. 640.
SCOLOPENDRIUM, iii. 640.
Scolopendrium lindeni, iii. 641.
—— nigripes, iii. 641.
—— vulgare, iii. 641.
Scolopospermum baltimoroides, ii. 144.
—— *fougerouxiæ*, ii. 144.
SCOPARIA, ii. 454.
Scoparia annua, ii. 454.
—— dulcis, ii. 454; iv. 113.

Scoparia flava, ii. 454.
Scorias robinsoni, iv. 159.
SCROPHULARIA, ii. 442.
Scrophularia coccinea, ii. 442.
—— *coccinea*, ii. 446.
—— nodosa, ii. 442.
SCROPHULARINEÆ, ii. 438; iv. 76, 105.
Scrophularineæ, iv. 188, 202, 215, 217, 225, 229, 231, 234, 257.
SCUTELLARIA, ii. 568.
Scutellaria, iv. 148.
Scutellaria cærulea, ii. 568.
—— *cærulea*, iv. 292.
—— coccinea, ii. 569.
—— costaricana, ii. 569.
—— drummondii, ii. 569; iv. 81.
—— heterophylla, ii. 569.
—— longifolia, ii. 569.
—— microphylla, ii. 569.
—— moçiniana, ii. 569.
—— multiflora, ii. 569.
—— purpurascens, ii. 569.
—— rumicifolia, iv. 81.
—— splendens, ii. 569.
Scyphæa, i. 98.
Scytanthus bambusarum, iii. 40.
SEBASTIANA, iii. 136.
Sebastiana actinostemoides, iii. 136.
—— *longipes*, iii. 137.
—— *schlechtendaliana*, iii. 137.
—— treculiana, iii. 136.
Sebastiania (?) bilocularis, iv. 87.
—— *treculiana*, iv. 87.
SECHIOPSIS, i. 492.
Sechiopsis triquetra, i. 492.
SECHIUM, i. 491.
Sechium chayota, i. 491.
—— edule, i. 491.
—— *palmatum*, i. 492; iv. 42.
Secondatia, ii. 313.
SECURIDACA, i. 62.
Securidaca acuminata, i. 62.
—— erecta, iv. 111.
—— mollis, i. 62.
—— *pubescens*, i. 63.
—— schlechtendaliana, i. 62.
—— sylvestris, i. 62.
—— tomentosa, i. 63.
—— volubilis, i. 63.
SEDUM, i. 392.
Sedum, i. 388, 390; iv. 148, 149, 213, 241.
—— *acre*, i. 398.
—— batesii, i. 392.
—— botterii, i. 393.
—— bourgæi, i. 393.
Sedum confusum, i. 393.
—— *cotyledon*, i. 389.
—— cupressoides, i. 394.
—— *cupressoides*, iv. 241.
—— dendroideum, i. 394.
—— *dendroideum*, i. 393; iv. 241.
—— ebracteatum, i. 394.
—— fuscum, i. 395.
—— greggii, i. 395.
—— guatemalense, i. 395.
—— *guatemalense*, iv. 285.
—— incertum, i. 396.
—— liebmannianum, i. 396.
—— miserum, i. 397.
—— moranense, i. 397.
—— napiferum, i. 397.
—— *napiferum*, iv. 285.
—— oxypetalum, i. 397.
—— palmeri, iv. 35.
—— parvum, i. 398.
—— præaltum, i. 398.
—— *reflexum*, i. 388.
—— retusum, i. 398.
—— *sparsiflorum*, i. 395.
—— *spathulifolium*, i. 393.
—— stelliforme, iv. 35.
—— tortuosum, i. 399.
—— wrightii, i. 399.
Selagineæ, iv. 189.
SELAGINELLA, iii. 704.
Selaginella, iv. 140, 213.
Selaginella apus, iii. 704.
—— binervis, iii. 705.
—— *brasiliensis*, iii. 705.
—— *californica*, iii. 704.
—— *canaliculata*, iii. 705.
—— chilensis, iii. 705.
—— *ciliata*, iii. 708.
—— *conduplicata*, iii. 707.
—— convoluta, iii. 705.
—— cuspidata, iii. 705.
—— *densifolia*, iii. 705.
—— diffusa, iii. 705.
—— *douglasii*, iii. 704.
—— erythropus, iii. 705.
—— *erythropus*, *β. major*, iii. 706.
—— eurynota, iii. 706.
—— exaltata, iii. 706.
—— faucium, iii. 706.
—— fendleri, iii. 706.
—— *ferruminata*, iii. 707.
—— *fimbriata*, iii. 709.
—— flabellata, iii. 706.
—— *flabellata*, iii. 704.
—— galeotti, iii. 706.
—— geniculata, iii. 707.
—— guatemalensis, iii. 707.
Selaginella homaliæ, iii. 707.
—— *incana*, iii. 705.
—— *increscentifolia*, iii. 708.
—— *incurvata*, iii. 707.
—— lepidophylla, iii. 707.
—— *lepidophylla*, iii. 704.
—— *liebmanni*, iii. 709.
—— lindeni, iii. 707.
—— lychnuchus, iii. 707.
—— *lychnuchus*, iii. 709.
—— *macroura*, iii. 709.
—— martensii, iii. 707.
—— microphylla, iii. 708.
—— *moritziana*, iii. 705.
—— nicaraguensis, iii. 708.
—— oaxacana, iii. 708.
—— *oregana*, iii. 704.
—— *pallescens*, iii. 705.
—— *parkeri*, iii. 706.
—— pilifera, iii. 708.
—— pœppigiana, iii. 707.
—— *pœppigiana*, *β. mexicana*, iii. 706.
—— porelloides, iii. 708.
—— puberula, iii. 708.
—— pulcherrima, iii. 708.
—— radiata, iii. 708.
—— *reticulata*, iii. 705.
—— rhizophora, iii. 708.
—— rupestris, iii. 708.
—— *rupestris*, iii. 704.
—— saccharata, iii. 709.
—— *saccharata*, var. *α. major*, iii. 709.
—— ——, var. *β. minor*, iii. 709.
—— *sanguinolenta*, iii. 709.
—— *sarmentosa*, iii. 705.
—— schiedeana, iii. 709.
—— schizobasis, iii. 709.
—— *serpens*, iii. 709.
—— sertata, iii. 709.
—— *spinosa*, iii. 704.
—— *spinulosa*, iii. 704.
—— *spirillum*, iii. 709.
—— *stellata*, iii. 706.
—— stenophylla, iii. 709.
—— *suavis*, iii. 706.
—— *subsplendens*, iii. 706.
—— *sulcangula*, iii. 705.
—— *thujæfolia*, iii. 708.
—— *tomentosa*, iii. 707.
—— *undulata*, iii. 706.
—— *vaginata*, iii. 707.
—— *vexata*, iii. 706.
—— viticulosa, iii. 709.
SELAGINELLACEÆ, iii. 704.

Selaginellaceæ, iv. 200, 203.
SELENIPEDIUM, iii. 307.
Selenipedium, iv. 271.
Selenipedium caudatum, iii. 307.
—— chica, iii. 307.
—— longifolium, iii. 308.
—— *longifolium*, iv. 295.
—— *warscewiczianum*, iii. 307.
SELINOCARPUS, iii. 6.
Selinocarpus, iv. 140, 141.
Selinocarpus angustifolia, iii. 6.
—— chenopodioides, iii. 6.
—— palmeri, iii. 6.
Selliguea elongata, iii. 677.
—— mexicana, iii. 678.
SELLOA, ii. 158.
Selloa, ii. 109.
Selloa plantaginea, ii. 158.
SEMEIANDRA, i. 463.
Semeiandra grandiflora, i. 463.
—— *grandiflora*, i. 465.
Senebiera dubia, i. 38.
—— *mexicana*, i. 39.
SENECIO, ii. 235; iv. 63.
Senecio, ii. 231, 237, 249; iv. 64, 148, 149, 150, 151, 212, 252, 305.
Senecio acerifolius, ii. 235; iv. 64.
—— *acerifolius*, ii. 249.
—— acutangulus, ii. 235.
—— *acutangulus*, ii. 249.
—— amplifolius, ii. 235.
—— *amplifolius*, ii. 249; iv. 288.
—— andrieuxii, ii. 236.
—— *andrieuxii*, ii. 250.
—— angulifolius, ii. 236; iv. 64.
—— *angulifolius*, ii. 238, 247, 250.
—— arborescens, ii. 236.
—— *arborescens*, ii. 240, 250.
—— argutus, ii. 236.
—— *argutus*, ii. 250; iv. 288.
—— aschenbornianus, ii. 236.
—— *aschenbornianus*, ii. 250.
—— *axillaris*, iv. 64.
—— barba-johannis, ii. 236.
—— *barba-johannis*, ii. 250; iv. 288.
—— bellidifolius, ii. 236.
—— *bellidifolius*, ii. 240, 249.
—— berlandieri, ii. 236.
—— *berlandieri*, ii. 250.
—— bigelovii, ii. 236.
—— *bigelovii*, ii. 249.
—— calcareus, ii. 236.
—— *calcareus*, ii. 249.
—— calocephalus, ii. 237.
—— *calocephalus*, ii. 250.
—— calophyllus, ii. 237.
—— *calophyllus*, ii. 249.
Senecio candelariæ, ii. 237.
—— *candelariæ*, ii. 249.
—— cardiophyllus, ii. 237.
—— *cardiophyllus*, ii. 249.
—— cervariæfolius, ii. 237.
—— *cervariæfolius*, ii. 235, 249.
—— cheiranthifolius, ii. 237.
—— *cheiranthifolius*, ii. 240, 249.
—— chenopodioides, ii. 237.
—— *chenopodioides*, ii. 249.
—— chiapensis, ii. 238.
—— *chiapensis*, ii. 249.
—— chrysactis, ii. 237.
—— *chrysactis*, ii. 249; iv. 289.
—— cinerarioides, ii. 238.
—— *cinerarioides*, ii. 250; iv. 289.
—— cirsiifolius, ii. 238.
—— *cirsiifolius*, ii. 249.
—— cirsioides, ii. 238.
—— *cirsioides*, ii. 249; iv. 289.
—— cordovensis, ii. 238.
—— *cordovensis*, ii. 250.
—— deppeanus, ii. 239.
—— *deppeanus*, ii. 250.
—— desertorum, ii. 239.
—— *desertorum*, ii. 249.
—— dictyophyllus, ii. 239.
—— *dictyophyllus*, ii. 249.
—— doratophyllus, ii. 239.
—— *doratophyllus*, ii. 249; iv. 289.
—— *eximius*, iv. 289.
—— farfarus, ii. 239.
—— *farfarus*, ii. 249; iv. 289.
—— flaccidus, ii. 239.
—— *flaccidus*, ii. 249.
—— formosus, ii. 239.
—— *formosus*, ii. 249.
—— galeottii, ii. 239.
—— *galeottii*, ii. 250; iv. 289.
—— gerberæfolius, ii. 240.
—— *gerberæfolius*, ii. 249; iv. 289.
—— *ghiesbreghtii*, ii. 240.
—— glabrior, ii. 240.
—— godmanii, ii. 240.
—— *godmanii*, ii. 249.
—— *grahami*, ii. 236.
—— grandifolius, ii. 240.
—— *grandifolius*, ii. 236, 250.
—— grayanus, ii. 241.
—— *grayanus*, ii. 249.
—— hartwegii, ii. 241.
—— *hartwegii*, ii. 249.
—— hederæfolius, ii. 241.
—— *hederæfolius*, ii. 249.
—— hellerii, iv. 64.
—— helodes, ii. 241.
—— *helodes*, ii. 249; iv. 289.
Senecio heracleifolius, ii. 241.
—— *heracleifolius*, ii. 249.
—— heterogamus, ii. 242.
—— *heterogamus*, ii. 249.
—— huachucanus, iv. 64.
—— insignis, ii. 242.
—— *insignis*, ii. 249.
—— jatrophoides, ii. 242.
—— *jatrophoides*, ii. 249.
—— jurgensenii, ii. 242.
—— *jurgensenii*, ii. 250.
—— kermesinus, ii. 242.
—— *kermesinus*, ii. 250.
—— *lineolatus*, ii. 247.
—— lobatus, ii. 242.
—— *lobatus*, ii. 249.
—— longilobus, ii. 242.
—— *longilobus*, ii. 249.
—— macrobotrys, ii. 243.
—— *macrobotrys*, ii. 249.
—— madrensis, iv. 64.
—— mairetianus, ii. 243.
—— *mairetianus*, ii. 250.
—— minor, ii. 243.
—— modesta, ii. 248.
—— moreliæ, ii. 243.
—— *moreliæ*, ii. 249.
—— mulgediifolius, ii. 243.
—— *mulgediifolius*, ii. 249.
—— multidentatus, ii. 243.
—— *multidentatus*, ii. 249; iv. 289.
—— multivenius, ii. 243.
—— *multivenius*, ii. 249; iv. 289.
—— napeæfolius, ii. 244.
—— *napeæfolius*, ii. 237, 249; iv. 289.
—— napellifolius, ii. 244.
—— *napellifolius*, ii. 249.
—— oaxacanus, ii. 244.
—— *oaxacanus*, ii. 250.
—— œrstedianus, ii. 244.
—— *œrstedianus*, ii. 249, 250; iv. 158, 389.
—— orizabensis, ii. 244.
—— *orizabensis*, ii. 249; iv. 289.
—— parasiticus, ii. 244.
—— *parasiticus*, ii. 249.
—— parryi, ii. 245.
—— *parryi*, ii. 249.
—— *pauciflorus*, ii. 248.
—— peltiferus, ii. 245.
—— *peltiferus*, ii. 249.
—— petasitis, ii. 245.
—— *petasitis*, ii. 250.
—— picridis, ii. 245.
—— *picridis*, ii. 249.
—— pinetorum, ii. 245

Senecio pinetorum, ii. 249.
—— pinnatisectus, ii. 245.
—— *pinnatisectus*, ii. 249.
—— platanifolius, ii. 246.
—— *platanifolius*, ii. 250.
—— præcox, ii. 246.
—— *præcox*, ii. 250.
—— procumbens, ii. 246.
—— *procumbens*, ii. 238, 249; iv. 289.
—— pullus, iv. 64.
—— radulæfolius, ii. 246.
—— *radulæfolius*, ii. 249.
—— regiomontanus, ii. 246.
—— *regiomontanus*, ii. 249.
—— reticulatus, ii. 246.
—— *reticulatus*, ii. 249.
—— roldana, ii. 246.
—— *roldana*, ii. 250.
—— *runcinatus*, ii. 234.
—— salignus, ii. 246; iv. 64.
—— *salignus*, ii. 250; iv. 289.
—— sanguisorbæ, ii. 246; iv. 64.
—— *sanguisorbæ*, ii. 245, 249.
—— sartorii, ii. 247.
—— *sartorii*, ii. 250.
—— schumannianus, ii. 247.
—— *schumannianus*, ii. 250.
—— sclerophyllus, ii. 247.
—— *sclerophyllus*, ii. 249.
—— scrobicarioides, ii. 247.
—— *scrobicarioides*, ii. 250.
—— *seemannii*, ii. 241.
—— sessilifolius, ii. 247.
—— *sessilifolius*, ii. 249.
—— sinuatus, ii. 247.
—— *sinuatus*, ii. 242, 249; iv. 289.
—— skinneri, ii. 247.
—— *skinneri*, ii. 250.
—— stœchadiformis, ii. 247.
—— *stœchadiformis*, ii. 246, 249.
—— subpeltatus, ii. 248.
—— *subpeltatus*, ii. 249.
—— *subverticillatus*, ii. 236.
—— tabularis, ii. 248.
—— *tabularis*, ii. 249.
—— tampicanus, ii. 248.
—— *tampicanus*, ii. 249.
—— thomasii, iv. 64.
—— tolucanus, ii. 248.
—— *tolucanus*, ii. 249.
—— *vernus*, ii. 246; iv. 121.
—— vulneraria, ii. 248.
—— *vulneraria*, ii. 249; iv. 289.
—— warszewiczii, ii. 248.
—— *warszewiczii*, ii. 250.
—— zimapanicus, ii. 248.
Senecio zimapanicus, ii. 249.
SENECIONIDEÆ, ii. 231.
Senecionideæ, iv. 184.
SENKENBERGIA, iii. 5.
Senkenbergia annulata, iii. 5.
—— coulteri, iii. 5.
—— *gypsophiloides*, iii. 5.
SERAPHYTA, iii. 218.
Seraphyta multiflora, iii. 218.
Serapias, iv. 148, 149, 150.
SERICODES, i. 159.
Sericodes greggii, i. 159; iv. 17.
Sericographis aschenborniana, ii. 520.
—— *ghiesbreghtiana*, ii. 520.
—— *haplostachya*, ii. 520.
—— *heterophylla*, ii. 520.
—— *incana*, ii. 521.
—— *macrophylla*, ii. 521.
—— *mohintli*, ii. 521.
—— *mollis*, ii. 521.
—— *neglecta*, ii. 521.
—— *tinctoria*, ii. 522.
—— *verrucosa*, ii. 521.
SERJANIA, i. 205; iv. 23.
Serjania, iv. 147, 213, 262.
—— *acapulcensis*, i. 206.
—— acuta, i. 205.
—— brachycarpa, i. 205.
—— brachystachya, i. 205.
—— cambessediana, i. 206.
—— caracasana, i. 206.
—— cardiospermoides, i. 206.
—— *cardiospermoides*, i. 209.
—— cornigera, i. 206.
—— curassavica, i. 206.
—— *cystocarpa*, iv. 23.
—— emarginata, i. 206.
—— *glabrescens*, i. 206.
—— goniocarpa, i. 206.
—— grandis, i. 206.
—— grayii, i. 206.
—— impressa, i. 206.
—— incisa, i. 206.
—— inebrians, i. 207.
—— inflata, iv. 23.
—— insignis, i. 207.
—— macrococca, i. 207.
—— mexicana, i. 207.
—— paniculata, i. 207.
—— plicata, i. 207.
—— polystachya, i. 207.
—— *pubescens*, i. 206, 207, 210.
—— racemosa, i. 207.
—— *racemosa*, i. 208.
—— rhombea, i. 207.
—— *salzmanniana*, i. 205.
Serjania samydea, i. 208.
—— scatens, i. 208.
—— schiedeana, i. 208.
—— seemanni, i. 208.
—— setulosa, i. 208.
—— sordida, i. 208.
—— sphenocarpa, i. 208.
—— subtriplinervis, i. 208.
—— trachygona, i. 208.
—— triquetra, i. 208.
—— vesicosa, i. 208.
Serophyton lanceolatum, iii. 119.
Sesamum indicum, ii. 500.
SESBANIA, i. 262.
Sesbania cavanillesii, iv. 27.
—— exasperata, i. 262.
—— longifolia, i. 263.
—— *longifolia*, iv. 27.
—— macrocarpa, i. 263.
—— picta, i. 263.
—— tomentosa, i. 263.
Seseli, iv. 150.
SESELINEÆ, i. 568.
Sesleria dactyloides, iii. 566.
SESUVIUM, i. 556.
Sesuvium portulacastrum, i. 556.
SETARIA, iii. 503.
Setaria auriculata, iii. 503.
—— caudata, iii. 503.
—— cirrosa, iii. 504.
—— composita, iii. 504.
—— *depauperata*, iii. 503.
—— effusa, iii. 504.
—— falcifolia, iii. 504.
—— flava, iii. 504.
—— geniculata, iii. 504.
—— glauca, iv. 114.
—— *glauca*, iii. 503, 505; iv. 165.
—— grisebachii, iii. 504.
—— imberbis, iii. 504.
—— jurgensenii, iii. 505.
—— lævis, iii. 505.
—— liebmanni, iii. 505.
—— longipila, iii. 505.
—— *longiseta*, iii. 504.
—— macrostachya, iii. 505.
—— onurus, iii. 505.
—— paniculifera, iii. 505.
—— penicillata, iii. 505.
—— pseudoverticillata, iii. 505.
—— *purpurascens*, iii. 504.
—— *rariflora*, iii. 503.
—— schiedeana, iii. 505.
—— semirugosa, iii. 506.
—— streptobotrys, iii. 506.
—— sulcata, iii. 506.

Setaria uniseta, iii. 506; iv. 94.
—— viridis, iii. 506.
SEYMERIA, ii. 458.
Seymeria, iv. 231.
Seymeria bipinnatisecta, ii. 458.
—— decurva, ii. 458.
—— pinnatifida, ii. 458.
—— virgata, ii. 458.
—— *virgata*, iv. 291.
Shultesia petræa, iii. 559.
SIBTHORPIA, ii. 454.
Sibthorpia parvifolia, ii. 454.
—— pichinchensis, ii. 454.
—— *pichinchensis*, iv. 291.
—— *retusa*, ii. 454.
Sicana odorifera, iv. 39.
Sicklera solanacea, ii. 424.
SICYDIUM, i. 485.
Sicydium lindheimeri, i. 485.
—— *lindheimeri*, iv. 40.
—— schiedeanum, iv. 42.
—— *schiedeanum*, i. 491.
—— tamnifolium, iv. 42.
SICYOIDEÆ, i. 490.
Sicyomorpha pruinosa, i. 194.
SICYOS, i. 490.
Sicyos, iv. 149, 304.
Sicyos angulatus, i. 490.
—— *bourgeanus*, i. 490.
—— depauperatus, i. 490.
—— *depauperatus*, iv. 42.
—— deppei, i. 490; iv. 42.
—— *eremocarpus*, i. 487, 489.
—— galeottii, iv. 42.
—— *gymnacanthus*, i. 487.
—— *helleri*, i. 492; iv. 42.
—— laciniatus, iv. 42.
—— microphyllus, i. 490.
—— *microphyllus*, iv. 42.
—— *palmatus*, iv. 42.
—— parviflorus, i. 490; iv. 42.
—— parvifolius, i. 491.
—— *parvifolius*, iv. 42.
—— *scaberrimus*, iv. 42.
—— *triqueter*, i. 492.
—— vitifolius, i. 491.
—— *vitifolius*, iv. 42.
SICYOSPERMA, i. 491.
Sicyosperma gracile, i. 491.
SIDA, i. 102.
Sida, i. 99; iv. 14, 213.
Sida acuta, i. 102.
—— *acuta*, i. 103.
—— aggregata, i. 102.
—— alata, iv. 13.
—— *alba*, i. 106.
—— *albida*, i. 108.
Sida althæifolia, i. 103.
—— *amplexifolia*, i. 109.
—— angustifolia, i. 102.
—— *angustifolia*, i. 106.
—— anomala, i. 103.
—— arguta, i. 103.
—— *arguta*, i. 107.
—— *asiatica*, i. 109.
—— *atrosanguinea*, i. 106.
—— *begonioides*, i. 105.
—— berlandieri, iv. 13.
—— *betonicæfolia*, i. 106.
—— bicolor, i. 103.
—— *brachypetala*, i. 103.
—— brachystemon, i. 103.
—— *capillaris*, i. 106.
—— carnea, i. 103.
—— carpinifolia, i. 103; iv. 97, 111.
—— *carpinifolia*, i. 102; iv. 148.
—— collina, i. 103.
—— cordifolia, i. 103; iv. 111.
—— costata, i. 103.
—— *crenatiflora*, i. 101.
—— *cristata*, i. 101.
—— diffusa, i. 103.
—— *diffusa*, i. 104, 106; iv. 13.
—— *disticha*, i. 102.
—— dombeyana, i. 104.
—— *dumosa*, i. 107.
—— *elata*, i. 110.
—— elliottii, i. 104.
—— *emarginata*, i. 107.
—— endlicheriana, i. 104.
—— *excelsior*, i. 108.
—— *filicaulis*, i. 104.
—— filiformis, i. 104.
—— *filiformis*, iv. 13.
—— filipes, iv. 13.
—— *floribunda*, i. 106.
—— *fœtida*, i. 107.
—— garckeana, i. 104.
—— *gaya*, i. 102.
—— *ghiesbreghtiana*, i. 105.
—— *gigantea*, i. 110.
—— glanduligera, i. 104.
—— glomerata, i. 104; iv. 13.
—— hænkeana, i. 104.
—— *hastata*, i. 101.
—— hederacea, i. 104.
—— *hederæfolia*, i. 105.
—— *herbacea*, i. 103.
—— hibisciformis, i. 104.
—— hilariana, i. 104.
—— *hirta*, i. 110.
—— *hondensis*, i. 106.
—— humilis, i. 105.
—— hyssopifolia, i. 105.
Sida jamaicensis, i. 105.
—— kunthiana, i. 105.
—— lepidota, i. 105.
—— lindeniana, i. 105.
—— *lindeniana*, i. 105.
—— *linearis*, i. 106.
—— linifolia, i. 105.
—— longipes, i. 105.
—— mexicana, i. 103.
—— *micans*, i. 103.
—— microphylla, i. 106.
—— *milleri*, i. 106.
—— *multiflora*, i. 103.
—— muricata, i. 105.
—— *nudiflora*, i. 108.
—— *occidentalis*, i. 102.
—— oxyphylla, i. 106.
—— paniculata, i. 106.
—— parvifolia, i. 104.
—— *periplocifolia*, i. 108.
—— *periptera*, i. 113.
—— physocalyx, i. 106.
—— pilosa, i. 106.
—— *planicaulis*, i. 103.
—— quinquenervia, i. 106.
—— *radiata*, i. 115.
—— *retrofracta*, i. 107.
—— rhombifolia, i. 106.
—— *rotundifolia*, i. 103.
—— salviæfolia, i. 106.
—— sessei, i. 106.
—— setifera, i. 106.
—— spinosa, i. 106.
—— *spiræfolia*, i. 103.
—— *stipulata*, i. 102, 103.
—— *supina*, i. 104, 106.
—— tragiæfolia, iv. 13.
—— *triangularis*, i. 102.
—— *triquetra*, i. 112.
—— ulmifolia, i. 107.
—— urens, i. 107.
—— venusta, i. 107.
—— *venusta*, iv. 13.
—— *verticillata*, i. 107.
—— vesicaria, i. 107.
SIDALCEA, i. 99.
Sidalcea malvæflora, i. 99.
—— *malvæflora*, iv. 13.
—— neo-mexicana, i. 99.
—— *neo-mexicana*, iv. 13.
—— *oregana*, i. 99.
Siderodendron ferreum, ii. 46.
—— *floribundum*, ii. 46.
—— *triflorum*, ii. 46.
Sideroxyloides ferreum, ii. 46.
SIDEROXYLON, ii. 296.
Sideroxylon cuneatum, ii. 297.

Sideroxylon mexicanum, ii. 296.
SIEGESBECKIA, ii. 157.
Siegesbeckia agrestis, ii. 157.
—— *cordifolia*, ii. 157.
—— *droseroides*, ii. 157.
—— flosculosa, ii. 157.
—— *jorullensis*, ii. 157; iv. 303.
—— orientalis, ii. 157.
SIEVEKINGIA, iii. 253.
Sievekingia suavis, iii. 253.
Sieversia paradoxa, i. 374.
Silaus peucedanoides, i. 565.
SILENE, i. 66.
Silene allamani, i. 66.
—— antirrhina, i. 66.
—— *greggii*, i. 66.
—— laciniata, i. 66; iv. 10.
—— *mexicana*, i. 66.
—— *moçiniana*, i. 66.
—— *schizolepis*, iv. 10.
SILENEÆ, i. 66.
SILVIA, ii. 458.
Silvia curialis, ii. 456.
—— prostrata, ii. 458.
—— serpyllifolia, ii. 459.
SIMABA, i. 172.
Simaba bicolor, i. 172.
—— cedron, i. 172.
SIMARUBA, i. 173.
Simaruba glauca, i. 173; iv. 111.
—— versicolor, i. 173.
SIMARUBACEÆ, i. 172; iv. 17, 98.
Simarubaceæ, iv. 216.
SIMARUBEÆ, i. 172.
Simarubeæ, i. 13; iv. 176, 203, 215, 230.
SIMMONDSIA, iii. 102.
Simmondsia californica, iii. 102.
Simsia amplexicaulis, ii. 183; iv. 57.
—— *auriculata*, ii. 184; iv. 57.
—— *cordata*, ii. 183; iv. 57.
—— *exaristata*, ii. 183.
—— *ficifolia*, ii. 183; iv. 57.
—— *grandiflora*, ii. 184.
—— *heterophylla*, ii. 184.
—— *hispida*, ii. 184.
—— *lagascæformis*, ii. 184.
—— *polycephala*, ii. 184.
—— *sanguinea*, ii. 185.
—— *schaffneri*, iv. 57.
—— sericea, ii. 185.
—— *subaristata*, ii. 185.
Sinapis arvensis, i. 38.
Sinclairia andromachioides, ii. 231.
—— *discolor*, ii. 232.
Sipania palustris, ii. 28.
SIPARUNA, iii. 68.
Siparuna andina, iii. 69.
—— cauliflora, iii. 69.
—— guianensis, iii. 69.
—— nicaraguensis, iii. 69.
—— panamensis, iii. 70.
—— *panamensis*, iii. 69.
—— pauciflora, iii. 70.
—— riparia, iii. 70.
—— sumichrastii, iii. 70.
Siphisia sericea, iii. 43.
SIPHOCAMPYLUS, ii. 264.
Siphocampylus, iv. 157, 253.
—— *bicolor*, ii. 267.
—— canescens, ii. 265.
—— coleoides, ii. 265.
—— comosus, ii. 265.
—— *corymbiflorus*, ii. 264.
—— costaricæ, ii. 265.
—— grandidentatus, ii. 265.
—— *grandidentatus*, ii. 265.
—— *guatemalensis*, ii. 264.
—— gutierrezii, iv. 66.
—— *gutierrezii*, iv. 157, 159.
—— mollis, ii. 265.
—— regelii, ii. 265.
—— thysanopetalus, ii. 265.
—— warscewiczii, ii. 265.
Siphonandra, ii. 44.
Siphoneranthemum fasciculatum, ii. 511.
SIPHONOGLOSSA, ii. 516.
Siphonoglossa, iv. 231, 258.
Siphonoglossa longiflora, ii. 516.
—— pilosella, ii. 516.
—— ramosa, ii. 516.
SISYMBRIEÆ, i. 34.
SISYMBRIUM, i. 34.
Sisymbrium, iv. 235.
Sisymbrium acuticarpum, iv. 6.
—— auriculatum, i. 35.
—— *auriculatum*, iv. 6.
—— berlandieri, i. 35.
—— canescens, i. 35; iv. 6.
—— *canescens*, iv. 283.
—— ——, var. *brevipes*, i. 36.
—— coulteri, i. 35.
—— elatior, i. 36.
—— galeottianum, i. 35.
—— ——, β. hygrophilum, iv. 6.
—— *galeottianum*, iv. 283.
—— hartwegianum, i. 36.
—— hispidulum, i. 35.
—— hygrophilum, i. 35.
—— palmeri, i. 36.
—— parryi, i. 36.
Sisymbrium patulum, i. 36.
—— polyspermum, i. 36.
—— *polyspermum*, i. 35.
—— schaffneri, i. 37.
—— streptocarpum, i. 37.
—— *titacacense*, iv. 6.
—— virletti, i. 37.
—— xerophilum, i. 35.
SISYRINCHIUM, iii. 329.
Sisyrinchium, iv. 150.
Sisyrinchium affine, iii. 330.
—— *affine*, iv. 295.
—— alatum, iii. 330.
—— *anceps*, iii. 330.
—— *andinum*, iii. 331.
—— *bermudiana*, iii. 330.
—— convolutum, iii. 330.
—— *gramineum*, iii. 330.
—— hartwegii, iii. 330.
—— *iridifolium*, iii. 330.
—— micranthum, iii. 330.
—— *micranthum*, iv. 295.
—— *moritzianum*, iii. 329.
—— *mucronatum*, iii. 330.
—— *rigidum*, iii. 331.
—— scabrum, iii. 330.
—— *scabrum*, iv. 295.
—— schaffneri, iii. 330.
—— tenuifolium, iii. 331.
—— tinctorium, iii. 331.
—— *tingens*, iii. 331.
SIUM, i. 566.
Sium angustifolium, i. 566.
Skiophila pulchella, ii. 482.
Skytanthus, ii. 310.
SLOANEA, i. 142.
Sloanea quadrivalvis, i. 142.
SLOANEÆ, i. 142.
SMILACEÆ, iii. 362.
SMILACINA, iii. 367.
Smilacina amœna, iii. 368.
—— *bertolonii*, iii. 367.
—— flexuosa, iii. 367.
—— laxiflora, iii. 368.
—— *macrophylla*, iii. 368.
—— nervulosa, iii. 368.
—— paniculata, iii. 368.
—— salvini, iii. 368.
—— *salvini*, iv. 295.
—— scilloidea, iii. 368.
—— *scilloidea*, iv. 295.
—— thyrsoidea, iii. 368.
SMILAX, iii. 362.
Smilax, iv. 147, 148, 163, 213, 262, 274, 299.
Smilax acuminata, iii. 365.
—— acutifolia, iii. 362.

Smilax angustiflora, iii. 362.
—— aristolochiæfolia, iii. 362.
—— armata, iii. 364.
—— *berterii*, iii. 363.
—— botterii, iii. 363.
—— bona-nox, iii. 363.
—— bracteata, iii. 365.
—— candelariæ, iii. 363.
—— christmarensis, iii. 364.
—— cognata, iii. 363.
—— cordifolia, iii. 363.
—— costaricæ, iii. 365.
—— *cumanensis*, iii. 365.
—— densiflora, iii. 364.
—— discolor, iii. 364.
—— *domingensis*, iii. 366.
—— erythrocarpa, iii. 364.
—— *flexuosa*, iii. 367.
—— glauca, iii. 364.
—— glaucocarpos, iii. 364.
—— havanensis, iii. 364.
—— hispida, iii. 364.
—— *houstoniana*, iii. 366.
—— *insignis*, iii. 366.
—— invenusta, iii. 364.
—— jalapensis, iii. 364.
—— lindeni, iii. 366.
—— *medica*, iii. 363.
—— mexicana, iii. 365; iv. 109.
—— *milleri*, iii. 362.
—— mollis, iii. 365.
—— moranensis, iii. 365.
—— *moranensis*, iv. 295.
—— multiflora, iii. 365.
—— obtusa, iii. 365.
—— officinalis, iii. 365.
—— *officinalis*, iii. 366.
—— papantlæ, iii. 363.
—— papyracea, iii. 366.
—— pavoniana, iii. 365.
—— *platycentron*, iii. 363.
—— polyodonta, iii. 363.
—— *pseudochina*, iii. 363.
—— *quadrangularis*, iii. 366.
—— rotundifolia, iii. 366.
—— schaffneriana, iii. 365.
—— schiedeana, iii. 363.
—— schlechtendalii, iii. 366.
—— senticosa, iii. 363.
—— spinosa, iii. 366.
—— subpubescens, iii. 366.
—— *sylvatica*, iii. 363, 365.
—— *tamnoides*, iii. 363.
—— *tetragona*, iii. 366.
—— tomentosa, iii. 366.
—— vulgaris, iii. 364.
—— wageneriana, iii. 367.
Smilax wrightii, iii. 363.
—— *xalapensis*, iii. 364.
SMODINGIUM, i. 221.
Smodingium andrieuxii, i. 221.
—— *andrieuxii*, iv. 25.
—— virletii, i. 221.
—— *virletii*, iv. 25.
SMYRNIUM, i. 565.
Smyrnium ægopodioides, i. 565.
—— *ægopodioides*, iv. 286.
—— *lineare*, i. 565.
SOBRALIA, iii. 294.
Sobralia, iii. 296.
Sobralia bletiæ, iii. 294.
—— *chlorantha*, iii. 296.
—— *citrina*, iii. 243.
—— decora, iii. 295.
—— fenzliana, iii. 295.
—— *fimbriata*, iii. 295.
—— galeottiana, iii. 295.
—— *klotzschiana*, iii. 295.
—— labiata, iii. 295.
—— lepida, iii. 295.
—— leucoxantha, iii. 295.
—— lindleyana, iii. 295.
—— *lindleyana*, iv. 295.
—— macrantha, iii. 296.
—— *macrantha*, iii. 295.
—— macrophylla, iii. 296.
—— roseo-alba, iii. 296.
—— *sessilis*, iii. 295.
—— suaveolens, iii. 296.
—— warscewiczii, iii. 296.
SOCRATEA, iii. 401.
Socratea, iv. 276.
Socratea durissima, iii. 401.
—— exorrhiza, iii. 401.
Socratesia melastomoides, ii. 273.
Sogalgina balbisioides, ii. 207.
—— *trilobata*, ii. 208.
SOLANACEÆ, ii. 403; iv. 74, 105.
Solanaceæ, iv. 188, 202, 215, 217, 225, 234, 256.
SOLANDRA, ii. 427.
Solandra grandiflora, ii. 427.
—— guttata, ii. 427.
—— lævis, ii. 427.
—— nitida, ii. 427.
SOLANUM, ii. 403.
Solanum, ii. 416; iv. 110, 148, 150, 163, 212, 256.
Solanum aculeatissimum, ii. 404.
—— aculeolatum, ii. 404.
—— aligerum, ii. 404.
—— *allogonum*, ii. 421.
—— amazonium, ii. 404; iv. 105.
—— amictum, ii. 404.
Solanum anacanthum, ii. 404.
—— andrieuxii, ii. 404.
—— angurium, ii. 404.
—— *angustifolium*, ii. 404.
—— anoplocladum, ii. 404.
—— appendiculatum, ii. 404.
—— *appendiculatum*, ii. 408.
—— asperum, ii. 405.
—— auriculatum, ii. 405.
—— *auriculatum*, var. *pulverulentum*, ii. 408.
—— axilliflorum, ii. 405.
—— bahamense, ii. 405.
—— *balbisii*, ii. 414.
—— besseri, ii. 405.
—— *bombense*, ii. 408.
—— brachystachys, ii. 405.
—— *brancæfolium*, ii. 414.
—— bulbo-castanum, ii. 405.
—— caavurana, ii. 405.
—— callicarpæfolium, ii. 405; iv 113.
—— calycinum, ii. 406.
—— campechiense, ii. 406.
—— campylocladum, ii. 406.
—— candidum, ii. 406.
—— cardiophyllum, ii. 406.
—— *cardiophyllum*, iv. 291.
—— cervantesii, ii. 406.
—— chenopodioides, ii. 406.
—— chloropetalon, ii. 406.
—— chrysacanthum, ii. 406.
—— chrysotrichum, ii. 406.
—— ciliolatum, ii. 406.
—— clathratum, ii. 407.
—— *conoides*, ii. 421.
—— *coriaceum*, ii. 409.
—— cornutum, ii. 407.
—— *coronopus*, ii. 421.
—— cortex-virens, ii. 407.
—— *crenato-dentatum*, ii. 412.
—— *cymosum*, ii. 410.
—— *decurrens*, ii. 414.
—— delilei, ii. 407.
—— demissum, ii. 407.
—— *demissum*, iv. 291.
—— densiflorum, ii. 407.
—— *dichotomum*, ii. 411.
—— diphyllum, ii. 407.
—— *diphyllum*, ii. 405.
—— divaricatum, ii. 407.
—— diversifolium, ii. 407.
—— elæagnifolium, ii. 407.
—— ensifolium, ii. 408.
—— fendleri, ii. 408.
—— *ferrugineum*, ii. 415.
—— flavescens, var. albescens, ii. 408.

Solanum floccosum, ii. 408.
—— fœtidum, ii. 408.
—— fontanesianum, ii. 408.
—— *fuscatum*, ii. 406.
—— galeottii, ii. 408.
—— geminiflorum, ii. 408.
—— *geminiflorum*, ii. 414.
—— *geminifolium*, ii. 414.
—— glabrum, ii. 408.
—— glaucescens, ii. 408.
—— glutinosum, ii. 408.
—— granuloso-leprosum, ii. 408.
—— hartwegi, ii. 408.
—— havanense, ii. 409.
—— hernandesii, ii. 409.
—— *heterandrum*, ii. 414.
—— heteroclitum, ii. 409.
—— heterodoxum, ii. 409.
—— *hindsianum*, ii. 407.
—— hispidum, ii. 409.
—— hookerianum, ii. 409.
—— houstoni, ii. 409.
—— humboldtii, ii. 409.
—— hybridum, ii. 409.
—— hygrophilum, ii. 409.
—— inclusum, ii. 409.
—— inops, ii. 410.
—— jamesii, ii. 410.
—— juripeba, ii. 410.
—— lamberti, ii. 410.
—— lanceæfolium, ii. 410.
—— lanceolatum, ii. 410.
—— *leiboldianum*, ii. 417.
—— lentum, ii. 410.
—— *leprosum*, ii. 407.
—— leptanthum, ii. 410.
—— leycesterianum, ii. 410.
—— *lindheimerianum*, ii. 416.
—— *lucidum*, ii. 405, 422.
—— luridum, ii. 410.
—— macrantherum, ii. 410.
—— *macrantha*, ii. 413.
—— macrophyllum, ii. 410.
—— mammosum, ii. 411.
—— martensii, ii. 411.
—— mexicanum, ii. 411.
—— *micranthum*, ii. 412.
—— mitlense, ii. 411.
—— moçinianum, ii. 411.
—— modestum, ii. 411.
—— *monanthum*, ii. 411.
—— multinervium, ii. 411.
—— *myriacanthum*, ii. 404.
—— neglectum, ii. 411.
—— *nicotianæfolium*, ii. 408.
—— nigrescens, ii. 411.
—— nigricans, ii. 411.
Solanum nigrum, ii. 412; iv. 105.
—— nigrum, var., iv. 113.
—— *nodiflorum*, ii. 412.
—— nudum, ii. 412; iv. 113.
—— nutans, ii. 412.
—— nyctaginioides, ii. 412.
—— oaxacanum, ii. 412.
—— *obtusifolium*, ii. 404.
—— obtusilobum, ii. 412.
—— *oleraceum*, ii. 412.
—— *oporinum*, ii. 410.
—— oxycarpum, ii. 412.
—— panamense, ii. 412.
—— pavonii, ii. 412.
—— pedunculare, ii. 412.
—— piliferum, ii. 413.
—— *piliferum*, iv. 291.
—— pilosissimum, ii. 413.
—— pilosiusculum, ii. 413.
—— pinnatisectum, ii. 413.
—— porphyranthum, ii. 413.
—— propinquum, ii. 413.
—— pruinosum, ii. 413.
—— *pterocaulon*, ii. 412.
—— *pubigerum*, ii. 406.
—— quadriflorum, ii. 413.
—— quinquangulare, ii. 413.
—— radiatum, ii. 413.
—— receptum, ii. 413.
—— refractum, ii. 413.
—— *rœmerianum*, ii. 407.
—— rossii, ii. 414.
—— rostratum, ii. 414.
—— rude-pannum, ii. 414.
—— sanctæ-catharinæ, ii. 414.
—— scabrum, ii. 414.
—— *scabrum*, ii. 409.
—— *scandens*, ii. 405.
—— *schiedeanum*, ii. 408.
—— schlechtendalianum, ii. 414.
—— seaforthianum, ii. 414.
—— sideroxyloides, ii. 414.
—— *sinuatum*, ii. 410.
—— sisymbriifolium, ii. 414.
—— somniculentum, ii. 415.
—— squamulosum, ii. 415.
—— *squamulosum*, iv. 291.
—— stephanodes, ii. 415.
—— stoloniferum, ii. 415.
—— *stoloniferum*, ii. 412; iv. 149.
—— suaveolens, ii. 415.
—— symphysicaulis, ii. 415.
—— synantherum, ii. 415.
—— tampicense, ii. 415.
—— tectum, ii. 415.
—— *tegorea*, ii. 417.
—— *texense*, ii. 407.
Solanum torvum, ii. 415; iv. 113.
—— tribulosum, ii. 416.
—— tricolor, ii. 416.
—— tridynamum, ii. 416.
—— triquetrum, ii. 416.
—— triste, ii. 416.
—— tuberiferum, ii. 416.
—— tuberosum, ii. 416; iv. 74.
—— ulmoides, ii. 416.
—— urceolatum, ii. 416.
—— utile, ii. 416.
—— vellereum, ii. 417.
—— *venosum*, ii. 405.
—— *veræ-crucis*, ii. 404.
—— verbascifolium, ii. 417; iv. 105, 113.
—— verrucosum, ii. 417.
—— *verrucosum*, iv. 291.
Solena latifolia, ii. 39.
Solenomelus, iii. 331.
SOLENOPHORA, ii. 481.
Solenophora coccinea, ii. 481.
—— endlicheriana, ii. 481.
—— insignis, ii. 481.
—— obscura, ii. 481.
SOLIDAGO, ii. 116.
Solidago, iv. 252.
Solidago californica, ii. 116.
—— *gonoclada*, ii. 116.
—— *limonifolia*, ii. 116.
—— marshalli, ii. 116.
—— mexicana, ii. 116.
—— nemoralis, var. incana, iv. 52.
—— odora, ii. 116.
—— paniculata, ii. 116.
—— *puncticulata*, ii. 116.
—— scabrida, ii. 116.
—— simplex, ii. 116.
—— spathulata, ii. 116.
—— velutina, ii. 117.
SOLIVA, ii. 230.
Soliva anthemifolia, ii. 230.
—— *mexicana*, ii. 230.
—— *pygmæa*, ii. 230.
SOMMERA, ii. 38.
Sommera arborescens, ii. 38.
Sonchus oleraceus, ii. 262.
SONERILEÆ, i. 422.
SOPHORA, i. 320.
Sophora occidentalis, i. 321.
—— secundiflora, i. 321.
—— sericea, i. 321.
—— *speciosa*, i. 321.
—— tomentosa, i. 321; iv. 112.
SOPHOREÆ, i. 320.
Soramia, i. 12.
Sorghum, iii. 530.

Sorghum avenaceum, iii. 530.
—— *halepense*, iii. 531.
—— *linneanum*, iii. 531.
—— *nutans*, iii. 530, 531.
—— *secundum*, iii. 531.
—— *vulgare*, iii. 531.
SOROCEA, iii. 150.
Sorocea, iii. 142.
Sorocea affinis, iii. 150.
—— *affinis*, iii. 142.
—— *mexicana*, iii. 142.
—— *muriculata*, iii. 150.
—— pubivena, iii. 150.
Soromanes cœnopteris, iii. 684.
—— *integrifolium*, iii. 684.
—— *serratifolium*, iii. 684.
Souroubea, i. 91.
—— *auriculata*, i. 92.
—— *exauriculata*, i. 92.
—— *guianensis*, i. 92.
SPANANTHE, i. 558.
Spananthe angulosa, i. 558.
—— paniculata, i. 559.
SPARATTANTHELIUM, i. 405.
Sparganium, iii. 416.
SPARGANOPHORUS, ii. 70.
Sparganophorus, iv. 231.
—— *ageratoides*, ii. 81.
—— *struchium*, ii. 70.
—— vaillantii, ii. 70.
—— *vaillantii*, iv. 231.
SPARTINA, iii. 509.
Spartina gouini, iii. 509.
—— *humilis*, iii. 561.
Spartium junceum, i. 231.
SPATHELIA, i. 176.
Spathelia rhoifolia, i. 176.
SPATHIPHYLLUM, iii. 428.
Spathiphyllum, iv. 229.
Spathiphyllum angustifolium, iii. 429.
—— atrovirens, iii. 428.
—— brevirostre, iii. 428.
—— cochlearispathum, iii. 428.
—— *fendleri*, iii. 429.
—— friedrichsthalii, iii. 428.
—— *friedrichsthalii*, iii. 429.
—— fulvovirens, iii. 429.
—— *heliconiifolium*, iii. 428.
—— *lanceolatum*, iii. 428.
—— latifolia, iii. 428.
—— *liebmanni*, iii. 428.
—— longirostre, iii. 428.
—— ortgiesii, iii. 429.
—— phryniifolium, iii. 429.
—— wendlandii, iii. 429.
Spathodea corymbosa, ii. 492.
Spathoscaphe arenbergiana, iii. 403.
Specklinia ciliaris, iii. 202.
—— *linearis*, iii. 199.
SPECULARIA, ii. 271.
Specularia perfoliata, ii. 271.
Spennera alata, i. 419.
—— *rostellata*, i. 419.
—— *rubricaulis*, i. 419.
SPERGULA, i. 72.
Spergula arenarioides, i. 72.
—— *saginoides*, i. 71.
SPERGULARIA, i. 72.
Spergularia mexicana, i. 72.
—— neglecta, i. 72.
SPERMACOCE, ii. 58.
Spermacoce aspera, ii. 58.
—— asperifolia, ii. 58.
—— bartlingiana, ii. 58.
—— *diodina*, ii. 56.
—— distans, ii. 58.
—— echioides, ii. 58.
—— ferruginea, ii. 58.
—— graminifolia, ii. 58.
—— hænkeana, ii. 59.
—— *hirta*, ii. 61.
—— lævigata, ii. 59.
—— *lævigata*, iv. 287.
—— lævis, ii. 59.
—— longiflora, ii. 59.
—— longiseta, ii. 59.
—— oaxacana, ii. 59.
—— ovalifolia, ii. 59.
—— *ovalifolia*, ii. 58.
—— parviflora, ii. 59.
—— patula, ii. 59.
—— podocephala, ii. 60.
—— portoricensis, ii. 60.
—— procera, ii. 60.
—— psyllioides, ii. 60.
—— *radula*, ii. 55.
—— *rigida*, ii. 55.
—— setosa, ii. 60.
—— spinosa, ii. 60.
—— subulata, ii. 60; iv. 48.
—— suffrutescens, ii. 60.
—— tenuior, ii. 60; iv. 102, 112.
—— *tetracocca*, ii. 56.
—— verticillata, ii. 60; iv. 112.
—— virgata, ii. 61.
SPERMACOCEÆ, ii. 55.
SPHACELE, ii. 552.
Sphacele alpina, ii. 552.
—— *alpina*, iv. 159, 292.
—— mexicana, ii. 552.
SPHÆRALCEA, i. 113.
Sphæralcea, iv. 230.
Sphæralcea angustifolia, i. 113; iv. 14.
—— dissecta, i. 114.
—— emoryi, i. 113.
—— fendleri, i. 113.
—— filicaulis, i. 113.
—— *filicaulis*, iv. 14.
—— floribunda, i. 113.
—— *galeottii*, i. 114.
—— hastulata, iv. 14.
—— incana, i. 114.
—— nutans, i. 114.
—— oblongifolia, i. 114.
—— setosa, i. 113.
—— *stellata*, iv. 14.
—— typica, i. 114.
—— umbellata, i. 114.
—— vitifolia, i. 114.
—— wrightii, i. 114.
SPHÆROCARDAMUM, i. 39.
Sphærocardamum nesliæforme, i. 39.
Sphærocionium asterothrix, iii. 599.
—— *ciliatum*, iii. 599.
—— *hirsutum*, iii. 599.
—— *schiedeanum*, iii. 599.
Sphæroma, i. 113.
—— *angustifolium*, i. 113.
—— *floribundum*, i. 113.
—— *wrightii*, i. 114.
Sphærotheca scoparioides, ii. 451.
Sphenantha scabra, i. 493.
SPHENOCLEA, ii. 270.
Sphenoclea pongatium, ii. 270.
—— zeylanica, ii. 270.
SPHENOSTIGMA, iii. 328.
Sphenostigma longispatha, iii. 328.
SPIGELIA, ii. 339.
Spigelia anthelmia, ii. 339.
—— coulteriana, ii. 339.
—— hedyotidea, ii. 339.
—— humboldtiana, ii. 339.
—— longiflora, ii. 339.
—— mexicana, ii. 339; iv. 113.
—— pauciflora, ii. 339.
—— *platyphylla*, ii. 340.
—— scabrella, ii. 339.
—— speciosa, ii. 339.
—— splendens, ii. 340.
—— *texana*, ii. 339.
SPILANTHES, ii. 192.
Spilanthes, ii. 153.
Spilanthes alba, ii. 192.
—— beccabunga, ii. 192.
—— bicolor, ii. 192.
—— *crocata*, ii. 187.
—— exasperata, ii. 193.
—— karwinskiana, ii. 193.

Spilanthes nitida, ii. 193.
—— *nuttallii*, iv. 103.
—— papposa, ii. 193.
—— parvifolia, ii. 193.
—— ramosa, ii. 193.
—— repens, iv. 103, 112.
—— sessilifolia, ii. 193.
—— *sessilifolia*, iv. 58.
—— subhirsuta, ii. 194.
—— uliginosa, ii 194.
Spilanthus, ii. 192.
SPIRACANTHA, ii. 77.
Spiracantha cornifolia, ii. 77.
SPIRÆA, i. 369.
Spiræa argentea, i. 369; iv. 150.
—— *ariæfolia*, i. 369.
—— cæspitosa, i. 369.
—— *californica*, i. 370.
—— discolor, i. 369.
—— *discolor*, iv. 284.
—— *dumosa*, i. 369.
—— *fissa*, i. 369.
—— *mexicana*, i. 369.
—— parvifolia, i. 369.
SPIRÆEÆ, i. 369.
SPIRANTHES, iii. 300.
Spiranthes, iv. 90, 149, 213, 268, 271, 303.
Spiranthes aguacatensis, iii. 300.
—— assurgens, iii. 300.
—— aurantiaca, iii. 300.
—— *aurantiaca*, iv. 301, 303.
—— *australis*, iv. 268.
—— chloræformis, iii. 300.
—— *chloræformis*, iv. 303.
—— cinnabarina, iii. 300.
—— *cinnabarina*, iv. 305.
—— colorans, iii. 300.
—— comosa, iii. 300.
—— costaricensis, iii. 300.
—— ensifolia, iii. 301.
—— funckiana, iii. 301.
—— galeottiana, iii. 301.
—— *galeottiana*, iv. 304.
—— graminea, iii. 301.
—— gutturosa, iii. 301.
—— hemichrea, iii. 301.
—— *hyemalis*, iv. 90.
—— *lanuginosa*, iv. 90.
—— *latifolia*, iv. 90.
—— llaveana, iii. 301.
—— longepetiolata, iii. 301.
—— lupulina, iii. 301.
—— *luteo-alba*, iv. 90.
—— *madrense*, iv. 269.
—— madrensis, iii. 301.
—— mechoacana, iii. 301.
Spiranthes minutiflora, iv. 90.
—— montana, iii. 301.
—— *montana*, iv. 90.
—— *ochracea*, iv. 90, 305.
—— orchioides, iii. 301.
—— *orchioides*, iv. 303.
—— *parasitica*, iv. 90.
—— pauciflora, iii. 302.
—— *pauciflora*, iv. 90.
—— polyantha, iii. 302.
—— *polyantha*, iv. 269.
—— prasophylla, iii. 302.
—— *pubens*, iv. 90, 303, 304.
—— pyramidalis, iii. 302.
—— ramentacea, iii. 302.
—— romanzoffiana, iv. 90.
—— *romanzoviana*, iv. 268, 269.
—— saccata, iii. 302.
—— *saccata*, iv. 301.
—— *sarcoglossa*, iv. 90.
—— sceptrodes, iii. 302.
—— schaffneri, iii. 302.
—— smithii, iii. 302.
—— sulphurea, iii. 302.
—— thelymitra, iii. 302.
—— *transversalis*, iv. 90.
—— trilineata, iii. 302.
—— *violacea*, iv. 90, 301.
Spirodela, iii. 435.
—— *polyrhiza*, iii. 436.
SPIRONEMA, iii. 395.
Spironema fragrans, iii. 395.
—— *orthandrum*, iii. 395.
SPIROSTACHYS, iii. 26.
Spirostachys occidentalis, iii. 26.
Spirostylis hænkeana, iii. 82.
Spodiopogon foliatus, iii. 520.
—— *latifolius*, iii. 522.
—— vaginatus, iii. 520.
SPONDIAS, i. 222.
Spondias edmonstonei, iv. 19.
—— lutea, i. 222; iv. 111.
—— *purpurea*, i. 222.
SPONDIEÆ, i. 222.
Spondylantha aphylla, i. 204, 468.
Sponia, iii. 140.
—— *canescens*, iii. 140.
—— *crassifolia*, iii. 140.
—— *grisea*, iii. 140.
—— *integerrima*, iii. 140.
—— *micrantha*, iii. 140.
—— *schiedeana*, iii. 140.
SPOROBOLUS, iii. 545.
Sporobolus, iii. 532; iv. 309.
Sporobolus atrovirens, iii. 545.
—— ciliatus, iii. 545.
—— cryptandrus, iii. 545.
Sporobolus cryptandrus, iv. 279.
—— *depauperatus*, iii. 546.
—— domingensis, iii. 545.
—— *elongatus*, iii. 546.
—— eminens, iii. 545.
—— *flexuosus*, iii. 545.
—— humifusus, iii. 546.
—— indicus, iii. 546; iv. 114.
—— jacquemontii, iv. 114.
—— *lamarckii*, iii. 546.
—— *minor*, iii. 546.
—— minutiflorus, iii. 546.
—— noterophila, iii. 546.
—— pilifera, iii. 546.
—— plumbeus, iii. 546.
—— *pungens*, iii. 548.
—— purpurascens, iii. 547.
—— ramulosus, iii. 547.
—— repens, iii. 547.
—— *rupestris*, iii. 545.
—— *tenacissimus*, iii. 546.
—— virginicus, iii. 547.
—— *virginicus*, iv. 279.
SPREKELIA, iii. 333.
Sprekelia, iii. 332.
Sprekelia formosissima, iii. 333.
—— *glauca*, iii. 334.
—— *karwinskii*, iii. 334.
—— *ringens*, iii. 334.
STACHYCEPHALUM, ii. 141.
Stachycephalum mexicanum, ii. 141.
Stachyophorbe cataractarum, iii. 403.
—— deckeriana, iii. 404.
—— montana, iii. 406.
—— oreophila, iii. 406.
—— *pygmæa*, iii. 406.
STACHYS, ii. 571.
Stachys, iv. 149, 150.
Stachys agraria, ii. 571.
—— *agraria*, iv. 81.
—— *arvensis*, ii. 571.
—— bigelovii, iv. 81.
—— boraginoides, ii. 571.
—— *boraginoides*, ii. 572.
—— *cardinalis*, ii. 571.
—— coccinea, ii. 571.
—— drummondii, ii. 572; iv. 81.
—— eriantha, ii. 572.
—— *excelsa*, ii. 572.
—— galeotti, ii. 572.
—— *galeotti*, iv. 292.
—— *grahami*, ii. 571.
—— hirsuta, ii. 572.
—— keerlii, ii. 572.
—— *keerlii*, iv. 293.

Stachys lindeni, ii. 572.
—— mexicana, ii. 572.
—— nepetæfolia, ii. 572.
—— parvifolia, ii. 572.
—— *parvifolia*, iv. 293.
—— pilosissima, ii. 573.
—— *pilosissima*, iv. 293.
—— repens, ii. 573.
—— *repens*, iv. 293.
—— rotundifolia, ii. 573.
—— schiedeana, ii. 573.
—— *schiedeana*, iv. 81.
STACHYTARPHETA, ii. 531.
Stachytarpheta acuminata, ii. 532.
—— albiflora, ii. 532.
—— *bifurca*, ii. 531.
—— cayennensis, ii. 532.
—— frantzii, ii. 532.
—— jamaicensis, ii. 532; iv. 107, 113.
—— mutabilis, ii. 532.
Stackhousieæ, iv. 177.
Stangeria, iv. 267.
STANHOPEA, iii. 256.
Stanhopea, iv. 301, 302, 303, 304.
—— *amœna*, iii. 259.
—— *aurea*, iii. 258.
—— bucephalus, iii. 256.
—— calceolus, iii. 256.
—— cirrhata, iii. 256.
—— costaricensis, iii. 257.
—— cymbiformis, iii. 257.
—— devoniensis, iii. 257.
—— eburnea, iii. 257.
—— ecornuta, iii. 257.
—— fregeana, iii. 257.
—— gibbosa, iii. 257.
—— *grandiflora*, iii. 256, 257.
—— graveolens, iii. 257.
—— *graveolens*, iii. 259.
—— *guttulata*, iii. 258.
—— inodora, iii. 257.
—— *jenischiana*, iii. 256.
—— *lindleyi*, iii. 258.
—— *maculosa*, iii. 257.
—— marshii, iii. 257.
—— martiana, iii. 258.
—— oculata, iii. 258.
—— pulla, iii. 258.
—— quadricornis, iii. 258.
—— ruckeri, iii. 258.
—— saccata, iii. 258.
—— *saccata*, iv. 301.
—— tigrina, iii. 258.
—— *tigrina*, iii. 257; iv. 118, 301.
—— ——, var. *nigroviolacea*, iii. 258.
—— *velata*, iii. 258.
—— wardii, iii. 258.
Stanhopea warscewicziana, iii. 259.
Stanhopeastrum ecornutum, iii. 257.
Stannia panamensis, ii. 39.
Stapelia bufonia, ii. 338.
Staphidiastrum rubrum, i. 431.
Staphidium bracteosum, i. 430.
—— *chinantlana*, i. 430.
—— *chrysanthum*, i. 430.
—— *confertiflorum*, i. 430.
—— *dependens*, i. 431.
—— *divaricatum*, i. 431.
—— *diversifolium*, i. 432.
—— *galeotti*, i. 431.
—— *gracile*, i. 431.
—— *lindenianum*, i. 431.
—— *octonum*, i. 430.
—— *pauciflorum*, i. 430.
—— *purpureum*, i. 430.
—— *spicatum*, i. 430.
—— *urceolatum*, i. 431.
STAPHYLEÆ, i. 215.
STATICE, ii. 287.
Statice brasiliensis, ii. 287.
—— limonium, ii. 287.
STAURANTHUS, i. 171.
Stauranthus perforatus, i. 172.
Staurochisia, i. 85, 86.
Steffensia adunca, iii. 45.
—— *obliqua*, iii. 52.
—— *oblonga*, iii. 47.
—— *plantaginea*, iii. 53.
—— *mollis*, iii. 52.
—— *tuberculata*, iii. 56.
Stegnocarpus canescens, ii. 371.
STEGNOSPERMA, iii. 30.
Stegnosperma, iv. 259.
Stegnosperma halimifolia, iii. 30.
STELIS, iii. 203.
Stelis, iv. 148.
—— *atropurpurea*, iii. 203.
—— ciliaris, iii. 203.
—— costaricensis, iii. 203.
—— endresii, iii. 203.
—— glossula, iii. 203.
—— lancilabris, iii. 203.
—— leucopogon, iii. 203.
—— liebmanni, iii. 203.
—— microstigma, iii. 203.
—— microtis, iii. 203.
—— obscurata, iii. 203.
—— ophioglossoides, iii. 204.
—— *ophioglossoides*, iv. 27.
—— pardipes, iii. 204.
—— parvula, iii. 204.
—— purpurascens, iii. 204.
—— thecoglossa, iii. 204.
—— tubata, iii. 204.
STELLARIA, i. 68.
Stellaria, iv. 148.
Stellaria aristata, i. 68.
—— baldwini, i. 68.
—— *baldwini*, iv. 10.
—— ciliata, iv. 10.
—— *cuspidata*, i. 68; iv. 10.
—— *elongata*, i. 69.
—— *lanuginosa*, i. 69.
—— nemorum, i. 68.
—— *nemorum*, iv. 10, 283.
—— ovata, i. 68.
—— prostrata, i. 68.
STEMMADENIA, ii. 310.
Stemmadenia bella, ii. 310.
—— bignoniæflora, ii. 310.
—— glabra, ii. 310.
—— *grandiflora*, ii. 309.
—— *guatemalensis*, ii. 310.
—— insignis, ii. 310.
—— mollis, ii. 310.
—— pubescens, ii. 310.
STEMODIA, ii. 449.
Stemodia angulata, ii. 450.
—— *arenaria*, ii. 450.
—— bartsioides, ii. 450.
—— durantifolia, ii. 450.
—— *ehrenbergiana*, ii. 450.
—— glabra, ii. 450.
—— jorullensis, ii. 450.
—— lanata, ii. 450.
—— parviflora, ii. 450.
—— peduncularis, ii. 450.
—— pusilla, ii. 450.
—— *verticillaris*, ii. 450.
Stemonacanthus macrophyllus, ii. 506.
STENANDRIUM, ii. 510.
Stenandrium chamæranthemoideum, ii. 510.
—— dulce, ii. 510.
STENANTHIUM, iii. 381.
Stenanthium, iv. 229.
Stenanthium frigidum, iii. 381.
—— *frigidum*, iv. 295.
Stenanthus heterophyllus, ii. 485.
—— *sanguinolentus*, ii. 487.
—— *serratus*, ii. 487.
—— *squarrosus*, ii. 487.
Stenochlæna sorbifolia, iii. 689.
Stenogramme ehrenbergiana, iii. 677
Stenolobium brachycarpum, i. 300.
—— *cæruleum*, i. 301.
—— *galactoides*, i. 301.
—— *molle*, ii. 496.
—— *stans*, ii. 497.
Stenoloma schlechtendalii, iii. 605.
Stenoptera, iii. 298.

Stenorrhynchus, iv. 271.
—— *aurantiacus*, iii. 300.
—— *cinnabarinus*, iii. 300.
—— *lupulinus*, iii. 301.
—— *madrensis*, iii. 301.
—— *mechoacanus*, iii. 301.
—— *montanus*, iii. 301.
—— *orchioides*, iii. 301; iv. 270.
—— *pauciflorus*, iii. 302.
—— *speciosus*, iii. 300.
—— *sulphureus*, iii. 302.
STENOSPERMATION, iii. 425.
Stenospermation angustifolium, iii. 425.
—— marantæfolium, iii. 425.
Stenostomum dichotomum, ii. 42, 372.
STENOTAPHRUM, iii. 509.
Stenotaphrum americanum, iii. 509.
—— *glabrum*, iii. 509.
STEPHANOMERIA, ii. 262.
Stephanomeria exigua, ii. 262.
—— *minor*, iv. 141.
—— schottii, ii. 262.
—— thurberi, ii. 262.
Stephanostachys alternans, iii. 403.
—— casperiana, iii. 403.
—— martiana, iii. 405.
—— *tepejilote*, iii. 407.
—— *wendlandiana*, iii. 407.
Stephanotrichum octonum, i. 430.
STERCULIA, i. 126.
Sterculia acerifolia, i. 126.
—— carthagenensis, i. 126.
—— *chica*, i. 126.
—— mexicana, i. 127.
—— oblongifolia, i. 127.
—— punctata, i. 127.
STERCULIACEÆ, i. 126; iv. 15, 97.
Sterculiaceæ, iv. 175, 203, 214, 216, 224, 230, 237.
STERCULIEÆ, i. 126.
Stereocaulon, iv. 149, 150.
Sterigmaria grandiflora; iii. 42.
Stevensia, ii. 16.
STEVIA, ii. 84.
Stevia, iv. 147, 149, 213, 252.
Stevia amabilis, iv. 49.
—— angustifolia, ii. 84.
—— *angustifolia*, iv. 287.
—— *arbutifolia*, iv. 150.
—— aschenborniana, ii. 84.
—— berlandieri, ii. 84; iv. 49.
—— canescens, ii. 84.
—— clinopodia, ii. 85.
—— *clinopodia*, iv. 287.
—— compacta, ii. 85.
Stevia conferta, ii. 88.
—— connata, ii. 85.
—— cordifolia, ii. 85.
—— coronifera, ii. 85.
—— dissitifolia, ii. 85.
—— dissoluta, ii. 85.
—— divaricata, ii. 85.
—— ehrenbergiana, ii. 85.
—— elatior, ii. 85.
—— elliptica, ii. 85.
—— eupatoria, ii. 85; iv. 49.
—— *eupatoria*, ii. 89.
—— fascicularis, ii. 86.
—— fastigiata, ii. 86.
—— glandulifera, ii. 86.
—— glandulosa, ii. 86.
—— glutinosa, ii. 86.
—— grandidentata, ii. 86.
—— hænkeana, ii. 86.
—— hirsuta, ii. 86.
—— hirtiflora, ii. 86.
—— hispidula, ii. 86.
—— *hyssopifolia*, ii. 85, 87.
—— ivæfolia, ii. 86.
—— jorullensis, ii. 86.
—— lanceolata, ii. 87.
—— latifolia, ii. 87.
—— *lavandulæfolia*, ii. 214.
—— laxiflora, ii. 87.
—— leucantha, ii. 87.
—— leuconeura, ii. 87.
—— linearifolia, ii. 87.
—— *linearis*, ii. 214.
—— lucida, ii. 87.
—— *macella*, ii. 87.
—— micrantha, ii. 87.
—— microcephala, ii. 87.
—— microchæta, ii. 87.
—— microphylla, ii. 87.
—— monardæfolia, ii. 88.
—— *monardæfolia*, iv. 287.
—— *multifida*, ii. 88.
—— nana, ii. 89.
—— nepetæfolia, ii. 88.
—— *nepetæfolia*, iv. 287.
—— nervosa, ii. 88.
—— nitida, ii. 88.
—— oaxacana, ii. 86.
—— origanifolia, ii. 88.
—— origanoides, ii. 88.
—— ovata, ii. 88.
—— paniculata, ii. 88; iv. 49.
—— *pedata*, ii. 214.
—— pilosa, ii. 88.
—— podocephala, ii. 88.
—— *podocephala*, ii. 84; iv. 287.
—— polyphylla, ii. 88.
Stevia pubescens, ii. 89.
—— *punctata*, ii. 85.
—— purpurea, ii. 89.
—— *purpurea*, ii. 87; iv. 49, 150.
—— pyrolæfolia, ii. 89.
—— *quinquearistata*, ii. 87.
—— ranunculoides, ii. 89.
—— reglensis, ii. 89.
—— rhombifolia, ii. 89.
—— salicifolia, ii. 89; iv. 50.
—— scabrella, ii. 89.
—— seemannii, ii. 89.
—— serrata, ii. 89.
—— stenophylla, ii. 89.
—— subpubescens, ii. 90.
—— *subpubescens*, iv. 287.
—— ternifolia, ii. 90.
—— tomentosa, ii. 90.
—— *tomentosa*, ii. 88.
—— trachelioides, ii. 90.
—— *trachelioides*, ii. 86.
—— trichopoda, ii. 90.
—— trifida, ii. 90.
—— triflora, ii. 90.
—— unicristata, ii. 90.
—— vigintiseta, ii. 90.
—— viminea, ii. 90.
—— viscida, ii. 90.
Sticteæ, iv. 149.
STIGMAPHYLLON, i. 151.
Stigmaphyllon ellipticum, i. 151.
—— fulgens, i. 152.
—— humboldtianum, i. 152; iv. 111.
—— hypargyreum, i. 152.
—— lindenianum, i. 152.
—— *mucronatum*, i. 151.
—— periplocifolium, i. 152.
—— retusum, i. 152.
—— *ternatum*, i. 151.
Stigmaphyllum ellipticum, iv. 16.
Stilaginella, iii. 105.
—— *benthami*, iii. 105.
STILLINGIA, iii. 135.
Stillingia acutifolia, iii. 135.
—— *acutifolia*, iv. 293.
—— angustifolia, iii. 135.
—— appendiculata, iii. 135.
—— *biglandulosa*, iii. 136.
—— lanceolata, iii. 135.
—— macrantha, iii. 135.
—— sanguinolenta, iii. 135.
—— sylvatica, iii. 135.
—— torreyana, iv. 87.
—— zelayensis, iii. 135.
STIPA, iii. 536.
Stipa, iii. 532, 538; iv. 309.

Stipa avenacea, iii. 536.
—— *brevicalyx*, iii. 538.
—— cærulea, iii. 536.
—— chapulcensis, iii. 536.
—— cirrosa, iii. 536.
—— coleotricha, iii. 536.
—— editorum, iii. 536.
—— eminens, iii. 536.
—— *eminens*, iv. 279.
—— erecta, iii. 536.
—— *eriostachya*, iii. 537.
—— *fimbriata*, iii. 538.
—— grisebachii, iii. 537.
—— *gynerioides*, iii. 537.
—— *ichu*, iii. 537.
—— jarava, iii. 537.
—— *jarava*, iv. 296.
—— leucotricha, iii. 537.
—— liebmanni, iii. 537.
—— linearifolia, iii. 537.
—— mucronata, iii. 537.
—— *neesiana*, iii. 536.
—— *pungens*, iii. 537.
—— subulata, iii. 537.
—— trochlearis, iii. 537.
—— virescens, iii. 537.
—— viridula, iii. 538.
—— *viridula*, iv. 279.
—— virletii, iii. 538.
Stiphonia mollis, i. 218.
Strelitzia, iii. 312.
Strephium strictiflorum, iii. 510.
Streptachne pilosa, iii. 534.
—— *scabra*, iii. 534.
—— *tenuis*, iii. 535.
STREPTANTHUS, i. 30.
Streptanthus carinatus, i. 30.
—— cordatus, i. 30.
—— linearifolius, i. 30.
—— *linearifolius*, iv. 5, 141.
—— *longifolius*, i. 31.
—— *micranthus*, iv. 5.
—— platycarpus, i. 30.
—— *virgatus*, i. 30.
STROBILACANTHUS, ii. 511.
Strobilacanthus lepidospermus, ii. 511.
Strobiloglossa candelariæ, ii. 517.
—— *microphylla*, ii. 517.
Strobilorhachis glabra, ii. 512.
Strombocarpa cinerascens, i. 344.
—— *pubescens*, i. 344.
Strumpfia maritima, iv. 112.
STRYCHNOS, ii. 343.
Strychnos darienensis, ii. 343.
—— panamensis, ii. 343.
Sturmia arnoglossophylla, iii. 212.
Sturmia bituberculata, iii. 212.
—— *elliptica*, iii. 212.
Stylidieæ, ii. 263; iv. 184.
Stylocline micropoides, ii. 135.
STYLOSANTHES, i. 272.
Stylosanthes glutinosa, i. 272.
—— guianensis, i. 272; iv. 29.
—— humilis, i. 272.
—— *mucronata*, i. 272.
—— mucronata, iv. 29.
—— procumbens, i. 272; iv. 29.
—— scabra, i. 273.
—— viscosa, i. 273.
—— *viscosa*, iv. 230.
STYRACEÆ, ii. 300.
Styraceæ, iv. 186, 204.
STYRAX, ii. 303.
Styrax, iv. 163.
Styrax argenteum, ii. 303.
—— glabrescens, ii. 303.
—— punctatum, ii. 303.
SUÆDA, iii. 26.
Suæda, iii. 27.
Suæda diffusa, iii. 26.
—— *fruticosa*, iii. 27.
—— ——, var. *multiflora*, iii. 26.
—— *maritima*, iii. 26.
—— suffrutescens, iii. 26.
—— torreyana, iii. 27; iv. 83.
Suriana maritima, iv. 111.
SWARTZIA, i. 322.
Swartzia grandiflora, i. 322.
—— myrtifolia, i. 322.
—— *ochnacea*, i. 322.
—— panamensis, i. 322.
—— *parviflora*, i. 323.
—— *pinnata*, i. 322.
—— *simplicifolia*, i. 322.
—— triphylla, i. 323.
—— *triphylla*, i. 322.
SWARTZIEÆ, i. 322.
SWEETIA, i. 322.
Sweetia panamensis, i. 322.
Swertia, iv. 148, 149.
—— *michauxiana*, ii. 353.
—— *parviflora*, ii. 352.
—— *plantaginea*, ii. 352.
SWIETENIA, i. 183.
Swietenia, iv. 230.
Swietenia humilis, i. 183.
—— mahogani, i. 183.
SWIETENIEÆ, i. 183.
Syllepis, iii. 519.
—— *polystachya*, iii. 519.
—— *ruprechtii*, iii. 519.
Symmeria, iv. 259.
SYMPHONIA, i. 87.
Symphonia, iv. 230.
Symphonia globulifera, i. 87.
—— *globulifera*, iv. 230.
SYMPHORICARPUS, ii. 4.
Symphoricarpus, ii. 4, 44; iv. 248.
—— *glaucescens*, ii. 4.
—— microphyllus, ii. 4; iv. 46.
—— *microphyllus*, iv. 287.
—— *montanus*, ii. 4.
—— rotundifolius, ii. 4.
Symplocos, i. 98; iv. 146, 301, 302.
SYMPLOCUS, ii. 301.
Symplocus berteri, ii. 302.
—— *cernua*, ii. 301.
—— ciliata, ii. 301.
—— coccinea, ii. 301.
—— costaricana, ii. 301.
—— hartwegi, ii. 301.
—— jurgensenii, ii. 301.
—— *jurgensenii*, ii. 302.
—— *limoncillo*, ii. 302.
—— martinicensis, ii. 302.
—— prionophylla, ii. 302.
—— pycnantha, ii. 302.
—— schiedeana, ii. 302.
—— speciosa, ii. 302.
SYNCEPHALANTHUS, ii. 219.
Syncephalanthus decipiens, ii. 220.
SYNECHANTHUS, iii. 407.
Synechanthus fibrosus, iii. 407.
—— warscewiczianus, iii. 408.
SYNEDRELLA, ii. 195.
Synedrella nodiflora, ii. 195.
SYNGONIUM, iii. 423.
Syngonium angustatum, iii. 423.
—— auritum, iii. 423.
—— *hoffmannii*, iii. 424.
—— neglectum, iii. 423.
—— œrstedianum, iii. 423.
—— peliocladum, iii. 424.
—— *plumieri*, iii. 423.
—— podophyllum, iii. 424.
—— *salvadorense*, iii. 424.
—— *schottianum*, iii. 424.
—— wendlandi, iii. 424.
—— xanthophilum, iii. 424.
SYNTHLIPSIS, i. 38.
Synthlipsis berlandieri, i. 38.
—— ——, var. hispida, iv. 6.
—— greggi, i. 38.
—— heterochroma, iv. 6.

TABEBUIA, ii. 494.
Tabebuia æsculifolia, ii. 494.
—— fuscata, ii. 494.

Tabebuia guayacan, ii. 495.
—— heterotricha, ii. 495.
—— *latifolia*, ii. 494.
—— leucoxyla, ii. 495.
—— mexicana, ii. 495.
—— palustris, ii. 495.
—— pentaphylla, ii. 495.
—— rosea, ii. 495.
—— *rufinervis*, ii. 494.
TABERNÆMONTANA, ii. 309.
Tabernæmontana acapulcensis, ii. 309; iv. 104.
—— *acapulcensis*, iv. 113.
—— alba, ii. 309.
—— *amygdalifolia*, ii. 309.
—— grandiflora, ii. 309.
—— litoralis, ii. 309.
—— macrophylla, ii. 309.
—— martensii, ii. 309.
Taccaceæ, iii. 353; iv. 196.
Tacsonia buchanani, i. 481.
—— *lævis*, i. 479.
—— *reflexiflora*, i. 479.
—— *sanguinea*, i. 479.
—— *viridiflora*, i. 480.
Tæniocarpum articulatum, i. 309.
Tæniopsis lineata, iii. 681.
—— scabrida, iii. 681.
Tæniostema micranthum, i. 47.
TÆNITIS, iii. 681.
Tænitis angustifolia, iii. 681.
—— *angustifolia*, iii. 654.
—— furcata, iii. 681.
—— lanceolata, iii. 682.
—— *linearis*, iii. 681.
TAGETES, ii. 221.
Tagetes, iv. 148, 252.
Tagetes angustifolia, ii. 221.
—— *angustifolia*, iv. 61, 288.
—— *clandestina*, ii. 221; iv. 61, 149.
—— *congesta*, ii. 222.
—— coronopifolia, ii. 221.
—— *coronopifolia*, iv. 61.
—— *corymbosa*, ii. 223.
—— erecta, ii. 222.
—— *filiformis*, ii. 223.
—— *florida*, ii. 222.
—— *fœniculacea*, ii. 222.
—— fœtidissima, ii. 222.
—— *fœtidissima*, iv. 61.
—— lemmoni, iv. 61.
—— lucida, ii. 222.
—— *lucida*, ii. 223.
—— lunulata, ii. 222.
—— macroglossa, ii. 222.
—— *major*, ii. 222.
—— micrantha, ii. 222.
Tagetes micrantha, iv. 288.
—— microglossa, ii. 222.
—— multifida, ii. 223.
—— multiseta, ii. 223.
—— *multiseta*, iv. 61.
—— oligocephala, ii. 223.
—— *oligocephala*, iv. 61.
—— *papposa*, ii. 219.
—— parryi, ii. 223.
—— patula, ii. 223.
—— peduncularis, ii. 223.
—— remotiflora, ii. 223.
—— schiedeana, ii. 223.
—— signata, ii. 223.
—— subulata, iv. 61.
—— *subulata*, ii. 223.
—— subvillosa, ii. 224.
—— tenuifolia, ii. 244.
—— *tenuifolia*, ii. 223.
—— wislizenii, ii. 224.
—— *wislizenii*, iv. 61.
—— zypaquirensis, ii. 224.
TALAUMA, i. 13.
Talauma, i. 13.
Talauma macrocarpa, i. 14.
—— mexicana, i. 13.
TALINOPSIS, i. 78.
Talinopsis frutescens, i. 78.
—— *frutescens*, iv. 142.
TALINUM, i. 78.
Talinum aurantiacum, i. 78.
—— lineare, i. 78.
—— mexicanum, i. 79.
—— napiforme, i. 79.
—— *paniculatum*, i. 79.
—— *parviflorum*, i. 79.
—— patens, i. 79; iv. 11.
—— reflexum, i. 80.
TAMARINDUS, i. 341.
Tamarindus indica, i. 341.
TAMARISCINEÆ, i. 81; iv. 12.
Tamariscineæ, iv. 174, 205, 224.
TAMONEA, ii. 535.
Tamonea scabra, ii. 535.
Tandonia ramosa, iii. 27.
TAPIRIA, i. 222.
Tapiria, iv. 25.
Tapiria cyrtocarpa, i. 222.
—— mexicana, iv. 25.
Tapogomea tomentosa, ii. 53.
TARAXACUM, ii. 261.
Taraxacum dens-leonis, ii. 261.
—— *mexicanum*, ii 261.
—— officinale, ii. 261; iv. 65.
TAUSCHIA, i. 563.
Tauschia coulteri, i. 563.
—— *coulteri*, iv. 286.
Tauschia nudicaulis, i. 563.
—— *nudicaulis*, iv. 286.
—— *texana*, iv. 46.
TAXEÆ, iii. 185.
TAXODIEÆ, iii. 185.
TAXODIUM, iii. 185.
Taxodium, iv. 229, 265.
—— *distichum*, iii. 185; iv. 143, 144.
—— *mexicanum*, iii. 185.
—— *montezumæ*, iii. 185.
—— mucronatum, iii. 185.
TAXUS, iii. 185.
Taxus, iv. 265.
Taxus globosa, iii. 185.
TECOMA, ii. 496.
Tecoma æsculifolia, ii. 494.
—— *fuscata*, ii. 494.
—— *guayacan*, ii. 495.
—— *heteropoda*, ii. 495.
—— *heterotricha*, ii. 495.
—— *mexicana*, ii. 495.
—— mollis, ii. 496.
—— *pentaphylla*, ii. 495, 496.
—— *rosea*, ii. 495.
—— *sorbifolia*, ii. 496.
—— stans, ii. 497.
—— *stans*, iv. 141.
—— ——, γ. *velutina*, ii. 496, 497.
—— viminalis, ii. 497.
TELANTHERA, iii. 16.
Telanthera, iv. 231.
—— *brasiliana*, iii. 16.
—— *glomerata*, iii. 17.
—— gracilis, iii. 16.
—— maritima, iii. 16.
—— *maritima*, iv. 231.
—— mexicana, iii. 16.
—— microcephala, iii. 16.
—— *microcephala*, iii. 17.
—— obovata, iii. 16.
—— polygonoides, iii. 16.
—— pubiflora, iii. 17.
—— pycnantha, iii. 17.
Teliostachya alopecuroidea, ii. 512.
Telmatophace gibba, iii. 436.
Teloxys cornuta, iii. 23.
Temnadenia cordata, ii. 314.
—— *glaucescens*, ii. 317.
—— *secundiflora*, ii. 315.
TEPHROSIA, i. 256.
Tephrosia chrysophylla, i. 257.
—— cinerea, i. 257; iv. 99, 111.
—— crassifolia, i. 257.
—— decumbens, i. 257.
—— *glabrescens*, i. 262.
—— lanata, i. 257.
—— leiocarpa, i. 257.

Tephrosia leptostachya, i. 257.
—— leucantha, i. 257.
—— *leucantha*, i. 259.
—— lindheimeri, i. 257.
—— littoralis, i. 257.
—— madrensis, i. 258.
—— *mollis*, i. 262.
—— nicaraguensis, i. 258.
—— nitens, i. 258.
—— *ochroleuca*, i. 262.
—— oroboides, i. 258.
—— *oroboides*, i. 257.
—— piscatoria, i. 258.
—— schiedeana, i. 258.
—— tenella, i. 258; iv. 27.
—— toxicaria, i. 258.
—— venosa, i. 258.
—— vicioides, i. 258.
—— virginiana, i. 258.
Tepualia, iv. 241.
TERAMNUS, i. 297.
Teramnus rhombifolius, i. 297.
—— uncinatus, i. 297.
—— volubilis, i. 297.
TERMINALIA, i. 402.
Terminalia buceras, i. 402.
—— catappa, iv. 100.
—— excelsa, i. 402.
—— oblonga, i. 403.
—— obovata, i. 403.
TERNSTRŒMIA, i. 92.
Ternstrœmia, iv. 229.
Ternstrœmia clusiæfolia, i. 92.
—— *lineata*, i. 92.
—— *peduncularis*, i. 92.
—— *revoluta*, iv. 13.
—— seemanni, i. 92.
—— sylvatica, i. 92; iv. 13.
—— tepezapote, i. 92.
TERNSTRŒMIACEÆ, i. 89; iv. 13.
Ternstrœmiaceæ, iv. 174, 203, 214, 216, 229, 237.
TERNSTRŒMIEÆ, i. 92.
Tesota, i. 260.
TESSARIA, ii. 133.
Tessaria borealis, ii. 134.
TETRACERA, i. 12.
Tetracera alata, i. 12.
—— erecta, i. 12.
—— *multiflora*, i. 11.
—— oblongata, i. 12.
—— portobellensis, i. 12.
—— rhamnifolia, i. 12.
—— salicifolia, i. 13.
—— sessiliflora, i. 13.
—— *sessiliflora*, i. 12.
Tetracera volubilis, i. 13.
Tetrachyron manicatum, ii. 206.
TETRACLEA, ii. 573.
Tetraclea coulteri, ii. 573.
—— *coulteri*, iv. 141.
TETRAMERIUM, ii. 525.
Tetramerium, iv. 233, 258.
—— *angustifolium*, ii. 526.
—— hispidum, ii. 525.
—— nervosum, ii. 526.
—— *nervosum*, ii. 525.
—— *odoratissimum*, ii. 47.
—— ovalifolium, ii. 526.
—— *ovalifolium*, iv. 233.
—— ovatum, ii. 526.
—— *platystegium*, ii. 526.
—— polystachyum, ii. 526.
—— scorpioides, ii. 526.
TETRANEMA, ii. 447.
Tetranema mexicana, ii. 447.
Tetranthera, iii. 76.
—— *cervantesii*, iii. 76.
—— *glaucescens*, iii. 76.
—— *neesiana*, iii. 76.
—— *villosa*, iii. 76.
TETRAPTERYS, i. 153.
Tetrapterys acapulcensis, i. 153.
—— argentea, i. 153.
—— calophylla, i. 153.
—— cotoneaster, i. 153.
—— eriocarpa, i. 154.
—— glabrifolia, i. 153.
—— inæqualis, i. 154.
—— mexicana, i. 154.
—— *panamensis*, i. 154.
—— schiedeana, i. 154.
—— seemanni, i. 154.
Tetrarhena, iii. 531.
TETRORCHIDIUM, iii. 105.
Tetrorchidium integrifolium, iii. 105.
—— rubrivenium, iii. 105.
TEUCRIUM, ii. 574.
Teucrium canadense, ii. 574.
—— cubense, ii. 574.
—— inflatum, ii. 574.
—— laciniatum, ii. 574.
THALAMIFLORÆ, i. 1.
Thalassia, iii. 196.
THALIA, iii. 310.
Thalia, iv. 231.
Thalia geniculata, iii. 310.
THALICTRUM, i. 3; iv. 2.
Thalictrum, iv. 147.
Thalictrum densiflorum, i. 3.
—— *densiflorum*, iv. 282.
—— fendleri, i. 3.
—— *fendleri*, iv. 2.
Thalictrum galeottii, iv. 2.
—— *gibbosum*, iv. 2.
—— hernandezii, i. 3.
—— *hernandezii*, iv. 2, 282.
—— lanatum, i. 3.
—— *lanatum*, iv. 2.
—— longistylum, i. 4.
—— *longistylum*, iv. 2.
—— mexicanum, i. 4.
—— peltatum, i. 4.
—— *peltatum*, i. 5; iv. 2.
—— pubigerum, i. 4.
—— *pubigerum*, iv. 2.
—— rutidocarpum, i. 4.
—— strigillosum, i. 4; iv. 2.
—— wrightii, i. 4.
—— *wrightii*, iv. 2.
THAMNOSMA, i. 167.
Thamnosma, iv. 230, 238.
Thamnosma montana, i. 168.
—— texana, i. 167.
Thelaia angustifolia, ii. 283.
—— *sartorii*, ii. 283.
Thelephora zonaria, iv. 150.
THELESPERMA, ii. 198.
Thelesperma gracile, ii. 198; iv. 58.
—— longipes, ii. 198.
—— simplicifolium, ii. 198.
THELYPODIUM, i. 31.
Thelypodium auriculatum, iv. 6.
—— linearifolium, iv. 5.
—— longifolium, i. 31.
—— micranthum, iv. 5.
—— petiolatum, i. 31.
—— wrightii, i. 31.
THENARDIA, ii. 312.
Thenardia floribunda, ii. 312.
—— suaveolens, ii. 312.
THEOBROMA, i. 133.
Theobroma, iv. 154.
Theobroma angustifolia, i. 133; iv. 15.
—— bicolor, i. 133.
—— cacao, i. 133.
—— ovatifolia, i. 133.
THESPESIA, i. 123.
Thespesia populnea, i. 123.
—— tomentosa, i. 123.
THEVETIA, ii. 307.
Thevetia andrieuxii, ii. 307.
—— cuneifolia, ii. 307.
—— gaumeri, iv. 104.
—— glabra, ii. 308.
—— neriifolia, ii. 307; iv. 104, 113.
—— nitida, ii. 307; iv. 113.
—— ovata, ii. 307.
—— plumeriæfolia, ii. 307.

Thevetia yecotli, ii. 307.
Thibaudia acuminata, ii. 272.
—— *crassifolia*, ii. 273.
—— *hookeri*, ii. 272.
—— *laurifolia*, iv. 302.
—— *longifolia*, iv. 167.
—— *mexicana*, ii. 272.
—— *pubescens*, ii. 273.
Thiodia serrata, i. 469.
Thlaspi, i. 40.
Thlaspi fendleri, i. 40.
THLASPIDEÆ, i. 40.
Thonningia janeirensis, iii. 88.
—— *mexicana*, iii. 88.
Thouinia, i. 213.
Thouinia decandra, i. 213.
—— *morisiana*, iii. 118.
—— villosa, i. 213.
Thrasya paspaloides, iii. 497.
Thrinax, iii. 412.
Thrinax, iv. 152, 276, 277.
Thrinax argentea, iii. 412.
—— *parviflora*, iv. 109.
Thunbergia alata, ii. 500.
Thurberia, i. 123.
—— *thespesioides*, i. 123.
THYMELÆACEÆ, iii. 79.
Thymelæaceæ, iv. 192, 205.
Thymophylla, ii. 221.
Thymophyllum, ii. 221.
Thymophyllum greggii, ii. 221.
—— setifolium, ii. 221.
Thymus xalapensis, ii. 547.
Thyrsacanthus, ii. 523.
Thyrsacanthus callistachyus, ii. 523.
—— cuspidatus, ii. 523.
—— flagellum, ii. 523.
—— foliaceo-bracteatus, ii. 523.
—— *lilacinus*, ii. 523.
—— *lindenianus*, ii. 511.
—— longifolius, ii. 524.
—— pantasmensis, ii. 524.
—— strictus, ii. 524.
—— tubæformis, ii. 524.
Thyrsanthus spicatus, ii. 312.
Thysanachne scoparia, iii. 515.
Thysanocarpus, i. 40.
Thysanocarpus curvipes, i. 40.
—— *elegans*, i. 40.
—— *pulchellus*, i. 40.
Tiarella, iv. 150.
Tigridia, iii. 326.
Tigridia, iv. 118, 299.
Tigridia atrata, iii. 326.
—— conchiflora, iii. 327.
—— curvata, iii. 326.
Tigrida dugesii, iv. 90.
—— grandiflora, iii. 327.
—— meleagris, iv. 90.
—— *oxypetala*, iii. 327.
—— pavonia, iii. 326.
—— *pavonia*, iv. 148, 149.
—— vanhouttei, iii. 327.
—— violacea, iii. 327.
Tildenia mexicana, iii. 62.
Tilia, i. 140.
Tilia, iv. 299, 309, 312.
—— *americana*, i. 141.
—— *heterophylla*, i. 141.
—— mexicana, i. 141; iv. 15.
—— *mexicana*, iv. 148.
TILIACEÆ, i. 136; iv. 15.
Tiliaceæ, iv. 175, 203, 214, 216.
TILIEÆ, i. 139.
Tillæa, i. 387.
Tillæa angustifolia, i. 387.
Tillandsia, iii. 319.
Tillandsia, iv. 148, 149, 153, 213, 271, 299.
Tillandsia aloides, iii. 319.
—— *aloides*, iii. 324.
—— *aloifolia*, iii. 320.
—— apicroides, iii. 319.
—— *apicroides*, iii. 324.
—— *azurea*, iii. 323.
—— brachycaulos, iii. 319.
—— bulbosa, iii. 319.
—— cærulea, iii. 319.
—— cæspitosa, iii. 319.
—— *cæspitosa*, iii. 323.
—— canescens, iii. 320.
—— *circinnata*, iii. 322.
—— complanata, iii. 320.
—— cyanea, iii. 320.
—— *deppeana*, iii. 321.
—— ehrenbergiana, iii. 320.
—— fasciculata, iii. 320.
—— filifolia, iii. 320.
—— *flavescens*, iii. 323.
—— flexuosa, iii. 320.
—— *flexuosa*, var. *pallida*, iii. 320.
—— foliosa, iii. 320, 321, 324.
—— gladioliflora, iii. 321.
—— *gladioliflora*, var. *purpurascens*, iii. 321.
—— grandis, iii. 321.
—— *heterophylla*, iii. 323.
—— karwinskiana, iii. 321.
—— kunthiana, iii. 321.
—— leiboldiana, iii. 321.
—— limbata, iii. 321.
—— malzinei, iii. 321.
—— *multicaulis*, iii. 319.
Tillandsia paniculata, iii. 321.
—— *platynema*, iii. 323.
—— polystachya, iii. 321.
—— *polystachya*, iii. 324.
—— *pulchella*, iii. 322.
—— *pulchra*, iii. 322.
—— quadrangularis, iii. 321.
—— recurvata, iii. 321.
—— *recurvata*, iv. 271.
—— recurvifolia, iii. 322.
—— ringens, iii. 322.
—— *schuchii*, iii. 317.
—— setacea, iii. 322.
—— *staticeflora*, iii. 320.
—— streptophylla, iii. 322.
—— *tenuifolia*, iii. 320, 322.
—— tortilis, iii. 322.
—— tricolor, iii. 322.
—— *uniflora*, iii. 322.
—— usneoides, iii. 322.
—— *usneoides*, iv. 263, 271.
—— variabilis, iii. 323.
—— variegata, iii. 323.
—— vestita, iii. 323.
—— *vestita*, iii. 324.
—— viminalis, iii. 323.
—— virginalis, iii. 323.
—— *vitellina*, iii. 324.
Timeroya, iv. 258.
Tinantia, iii. 390.
Tinantia anomala, iii. 390.
—— fugax, iii. 390.
—— *fugax*, iv. 295.
—— *gypsophiloides*, iii. 5.
—— undata, iii. 390.
TINOSPOREÆ, i. 20.
Tithonia, ii. 176.
Tithonia angustifolia, ii. 177.
—— aristata, ii. 176.
—— *calva*, ii. 167, 168.
—— *excelsa*, ii. 177.
—— heterophylla, ii. 176.
—— *ovata*, ii. 173.
—— *pachycephala*, ii. 178.
—— recurrens, ii. 176.
—— scaberrima, ii. 176.
—— *scaberrima*, ii. 168.
—— speciosa, ii. 176.
—— tagetiflora, ii. 177.
—— thurberi, ii. 177.
—— tubæformis, ii. 177.
Tithymalopsis sphærorrhiza, iii. 101.
Tithymalus calyculatus, iii. 92.
Tmesipteris, iii. 700, 703; iv. 282.
Tococa, i. 429.
Tococa coriacea, i. 429.
—— *vesiculosa*, i. 432.

Tocoyena latifolia, ii. 39.
—— *macrophylla*, ii. 39.
Todaroa, iii. 292.
—— *micrantha*, iii. 292.
TODDALIEÆ, i. 170.
Todea, iii. 691.
Tontelea, i. 194.
—— *hookeriana*, i. 193.
TOPOBEA, i. 434.
Topobea calycularis, i. 434.
—— *fragrans*, i. 434.
—— lævigata, i. 434.
—— superba, i. 434.
Tornelia fragrans, iii. 426.
Tortula, iv. 148, 149, 150.
TOURNEFORTIA, ii. 371.
Tournefortia acutiflora, ii. 372.
—— asperrima, ii. 372.
—— bicolor, ii. 372.
—— billbergiana, ii. 372.
—— calycina, ii. 372.
—— candida, ii. 372.
—— capitata, ii. 372.
—— chrysantha, ii. 372.
—— densiflora, ii. 372.
—— elliptica, ii. 373.
—— ferruginea, ii. 373.
—— gnaphalioides, iv. 113.
—— hartwegiana, ii. 373.
—— hernandesii, ii. 373.
—— hirsutissima, ii. 373.
—— lævigata, iv. 113.
—— laurifolia, ii. 373.
—— mexicana, ii. 373.
—— monclovana, iv. 72.
—— mutabilis, ii. 373.
—— petiolaris, ii. 373.
—— schiedeana, ii. 373.
—— trichocalycina, ii. 373.
—— *undulata*, ii. 373.
—— velutina, ii. 373.
—— volubilis, iv. 113.
TOURRETIA, ii. 497.
Tourretia lappacea, ii. 497.
TOVARIA, i. 45.
Tovaria, iii. 367.
—— *flexuosa*, iii. 367, 368.
—— *laxiflora*, iii. 368.
—— *nervulosa*, iii. 368.
—— *paniculata*, iii. 368.
—— pendula, i. 45.
—— *salvini*, iii. 368.
—— *scilloides*, iii. 368.
—— *thyrsoidea*, iii. 368.
TOVOMITA, i. 87.
Tovomita stylosa, i. 88.
Tovomitopsis, i. 87.
Tovomitopsis costa-ricana, i. 87.
—— *glauca*, i. 87.
—— *nicaraguensis*, i. 87.
—— *psychotriæfolia*, i. 87.
TOWNSENDIA, ii. 118.
Townsendia mexicana, ii. 118.
—— strigosa, ii. 118.
—— *strigosa*, iv. 141.
Toxosiphon lindeni, i. 167.
TRACHELOSPERMUM, ii. 313.
Trachelospermum, iv. 229.
Trachelospermum difforme, ii. 313.
Trachodes paniculatus, ii. 262.
Trachyandra escheandoides, iv. 91.
TRACHYPOGON, iii. 522.
Trachypogon, iv. 232, 280.
Trachypogon angustifolius, iii. 522.
—— *angustifolius*, iv. 296.
—— canescens, iii. 523.
—— *canescens*, iii. 522.
—— dactyloides, iii. 523.
—— *dactyloides*, iii. 522.
—— dissolutus, iii. 523.
—— *dissolutus*, iii. 522.
—— gouini, iii. 523.
—— *gouini*, iii. 522.
—— *laguroides*, iii. 527.
—— *mollis*, iii. 523.
—— montufari, iii. 523.
—— ——, var. mollis, iii. 523.
—— ——, var. pilosus, iii. 523.
—— *montufari*, iii. 522, 524.
—— ——, var. *hirsutus*, iii. 523.
—— mülleri, iii. 523.
—— *mülleri*, iii. 522.
—— *nana*, iv. 91.
—— *polymorphus*, iii. 522.
—— ——, var. *canescens*, iii. 523.
—— ——, var. *montufari*, iii. 522, 523.
—— *preslei*, iii. 523.
—— *scrobiculatus*, iii. 524.
TRADESCANTIA, iii. 390.
Tradescantia, iii. 388, 397; iv. 148.
Tradescantia acaulis, iii. 391.
—— amplexicaulis, iii. 391.
—— andrieuxii, iii. 391.
—— *anomala*, iii. 390.
—— *biandra*, iii. 388.
—— *bifida*, iii. 390.
—— botterii, iii. 393.
—— *callisia*, iii. 395.
—— *commelina*, iii. 390.
—— commelinoides, iii. 391.
—— *congesta*, iii. 392.
—— crassifolia, iii. 391.
—— *crassifolia*, iv. 295.
Tradescantia crassula, iii. 392.
—— cumanensis, iii. 392.
—— *decumbens*, iii. 393.
—— *discolor*, iii. 396.
—— diuretica, iii. 392.
—— *divaricata*, iii. 389.
—— dracænoides, iii. 393.
—— *ehrenbergiana*, iii. 392.
—— elongata, iii. 392.
—— *erecta*, iii. 390.
—— *filiformis*, iii. 396.
—— *floribunda*, iii. 393.
—— *galeottiana*, iii. 393.
—— geniculata, iii. 392.
—— glabrata, iii. 391.
—— glabrior, iii. 392.
—— graminifolia, iii. 394.
—— *herba-ratti*, iii. 391.
—— holosericea, iii. 393.
—— *holosericea*, iv. 296.
—— *humboldtiana*, iii. 391.
—— *iridescens*, iii. 391.
—— karwinskiana, iii. 393.
—— kunthiana, iii. 393.
—— *lanuginosa*, iii. 391.
—— *latifolia*, iii. 390.
—— laxiflora, iii. 393.
—— leiandra, iii. 393.
—— *leiandra*, iii. 388.
—— ——, var. *brevifolia*, iii. 397.
—— linearis, iii. 393.
—— *martensiana*, iii. 395.
—— *mexicana*, iii. 392.
—— micrantha, iii. 394.
—— minuta, iii. 394.
—— *multiflora*, iii. 391.
—— nana, iii. 394.
—— *nana*, iv. 296.
—— pulchella, iii. 394.
—— *rhodantha*, iii. 394.
—— rotundifolia, iii. 391.
—— schlechtendalii, iii. 392.
—— schiedeana, iii. 393.
—— *spathacea*, iii. 396.
—— *speciosa*, iii. 391.
—— triandra, iii. 392.
—— *triflora*, iii. 393.
—— *umbellata*, iii. 390.
—— *undulata*, iii. 390.
—— velutina, iii. 394.
—— venustula, iii. 394.
—— warscewicziana, iii. 394.
TRAGIA, iii. 131.
Tragia amblyodonta, iii. 132.
—— *angustifolia*, iii. 132.
—— bailloniana, iii. 131.
—— dissecta, iii. 131.

Tragia genuina, iii. 132.
—— laciniata, iii. 131.
—— latifolia, iii. 132.
—— mexicana, iii. 131.
—— nepetæfolia, iii. 131.
—— ramosa, iii. 132.
—— *scutellariæfolia*, iii. 132.
—— stylaris, iii. 132.
—— teucriifolia, iii. 132.
—— urticæfolia, iii. 132.
—— *urticæfolia*, var. *laciniata*, iii. 131.
—— volubilis, iv. 114.
TRAGOCEROS, ii. 152.
Tragoceros flavicomum, ii. 152.
—— microglossum, ii. 152.
—— schiedeanum, ii. 152.
—— zinnioides, ii. 152.
TRAGUS, iii. 518.
—— *occidentalis*, iii. 518.
—— racemosus, iii. 518.
—— *racemosus*, iii. 516.
TREMA, iii. 140.
Trema canescens, iii. 140.
—— micrantha, iii. 140; iv. 114.
—— *schiedeana*, iii. 140.
Tremandreæ, iv. 173.
Tresanthera, ii. 14.
Trevirana candida, ii. 477.
—— *grandiflora*, ii. 474.
—— *heterophylla*, ii. 474.
—— *maculata*, ii. 474.
—— *parviflora*, ii. 489.
—— *pulchella*, ii. 474.
Triæna, iii. 560.
—— *racemosa*, iii. 564.
TRIANOSPERMA, i. 486.
Trianosperma attenuata, i. 486.
—— *attenuata*, iv. 41.
—— racemosa, i. 486.
—— *racemosa*, iv. 41.
TRIANTHEMA, i. 556.
Trianthema monogyna, i. 556.
Triathera, iii. 560.
Triathera americana, iii. 564.
—— *gracilis*, iii. 564.
TRIBULUS, i. 158.
Tribulus cistoides, i. 158.
—— grandiflorus, i. 158.
—— maximus, i. 158; iv. 97.
Tricerastes glomerata, i. 501.
TRICERATIA, i. 491.
Triceratia bryonioides, i. 491.
—— *bryonioides*, iv. 42.
Tricerma crassifolius, i. 189.
TRICHANTHERA, ii. 509.
Trichanthera gigantea, ii. 509.
Trichelostylis mucronulata, iii. 458.
Tricherostigma fulgens, iii. 94.
TRICHILIA, i. 182.
Trichilia, iv. 230.
Trichilia cinerascens, i. 183.
—— havanensis, i. 182.
—— karwinskiana, i. 182.
—— lanceolata, i. 182.
—— multijuga, i. 182.
—— œrstediana, i. 182.
—— oligantha, i. 182.
—— pallida, i. 183.
—— propinqua, i. 183.
—— schiedeana, i. 183.
—— *sloanei*, iv. 98.
—— spondioides, i. 183.
—— terminalis, iv. 98.
—— *terminalis*, iv. 110.
—— tuberculata, i. 183.
TRICHILIEÆ, i. 181.
TRICHLORIS, iii. 559.
Trichloris fasciculata, iii. 559.
—— pluriflora, iii. 560.
Trichobactris bifida, iii. 413.
—— *glandulosa*, iii. 413.
TRICHOCENTRUM, iii. 270.
Trichocentrum caloceras, iii. 271.
—— candidum, iii. 271.
—— capistratum, iii. 271.
—— fuscum, iii. 271.
—— hoegei, iii. 271.
—— pfavii, iii. 271.
—— tigrinum, iii. 271.
Trichochloa ciliata, iii. 539.
—— *debilis*, iii. 540.
—— *mexicana*, iii. 551.
—— *microsperma*, iii. 540.
—— *mucronata*, iii. 541.
—— *quadridentata*, iii. 541.
—— *rigida*, iii. 542.
—— *setosa*, iii. 540.
—— *stipoides*, iii. 542.
—— *tenella*, iii. 542.
—— *virescens*, iii. 543.
TRICHOCORONIS, ii. 80.
Trichocoronis greggii, ii. 80.
—— rivularis, ii. 80.
Trichodiclidia, iii. 495.
Trichodium decumbens, iii. 550, 551.
—— *laxiflorum*, iii. 551.
—— *montanum*, iii. 551.
Trichodrymonia congesta, ii. 482.
Tricholæna insularis, iii. 490.
—— *obtecta*, iii. 493.
—— *saccharoides*, iii. 482.
TRICHOMANES, iii. 601.
Trichomanes, iii. 597.
Trichomanes alatum, iii. 601.
—— *apodum*, iii. 603.
—— *attenuatum*, iii. 601.
—— bancroftii, iii. 601.
—— botryoides, iii. 601.
—— *cavifolium*, iii. 603.
—— *collariatum*, iii. 603.
—— crispum, iii. 601; iv. 115.
—— daucoides, iii. 602.
—— elegans, iii. 602.
—— *floribundum*, iii. 602.
—— *galeottii*, iii. 601.
—— godmani, iii. 602.
—— *hænkei*, iii. 601.
—— kaulfussi, iii. 602.
—— *kaulfussii*, iii. 601.
—— kraussii, iii. 602.
—— *lindeni*, iii. 604.
—— *lucens*, iii. 601, 602.
—— *macroclados*, iii. 604.
—— *mexicanum*, iii. 603.
—— *nanum*, iii. 601.
—— *olivaceum*, iii. 603.
—— *pellucens*, iii. 601.
—— pinnatum, iii. 602.
—— punctatum, iii. 602.
—— pusillum, iii. 603.
—— pyxidiferum, iii. 603.
—— *quercifolium*, iii. 603.
—— radicans, iii. 603.
—— reptans, iii. 603.
—— rigidum, iii. 603; iv. 115.
—— scandens, iii. 604.
—— *scandens*, iii. 603.
—— *schaffneri*, iii. 603.
—— *schiedeanum*, iii. 604.
—— sinuosum, iii. 604.
—— spicatum, iii. 604.
—— *tenellum*, iii. 604.
—— tenerum, iii. 604.
—— trichoideum, iii. 604.
Trichophorus cyperinum, iii. 462.
TRICHOPILIA, iii. 272.
Trichopilia, iv. 302.
—— *coccinea*, iii. 272.
—— galeottiana, iii. 272.
—— *galeottiana*, iv. 302.
—— maculata, iii. 272.
—— marginata, iii. 272.
—— *picta*, iii. 272.
—— tortilis, iii. 272.
—— *tortilis*, iv. 302.
—— suavis, iii. 272.
—— turialbæ, iii. 272.
—— *turialvæ*, iii. 272.
TRICHOSACME, ii. 329.
Trichosacme, iv. 254.

Trichosacme lanata, ii. 330.
Trichosorus densus, iii. 594.
—— *frigidus*, iii. 594.
—— *glaucescens*, iii. 594.
Trichospira menthoides, ii. 195.
TRICHOSTEMA, ii. 573.
Trichostema arizonicum, ii. 573.
—— *dichotomum*, ii. 573.
Trichostomum, iv. 150.
Tricuspis monstra, iii. 570.
—— *mutica*, iii. 569.
—— *pulchella*, iii. 569.
Tridachne virens, iii. 293.
TRIDAX, ii. 207.
Tridax alboradiata, ii. 208.
—— balbisioides, ii. 207.
—— bicolor, ii. 207.
—— brachylepis, ii. 207.
—— candidissima, ii. 207.
—— coronopifolia, ii. 207.
—— obovata, ii. 208.
—— palmeri, ii. 208.
—— procumbens, ii. 208; iv. 103.
—— trifida, ii. 208.
—— trilobata, ii. 208.
TRIDIMERIS, i. 20.
Tridimeris hahniana, i. 20.
TRIFOLIEÆ, i. 231.
TRIFOLIUM, i. 232.
Trifolium, i. 231.
Trifolium amabile, i. 232.
—— *amabile*, i. 233; iv. 149, 284.
—— *fimbriatum*, i. 232.
—— involucratum, i. 232.
—— *involucratum*, iv. 284.
—— longifolium, i. 232.
—— mexicanum, i. 233.
—— pauciflorum, i. 233.
—— reflexum, i. 233.
—— *reflexum*, iv. 25.
—— rhombeum, i. 233.
—— schiedeanum, iv. 25.
—— variegatum, i. 233.
TRIGLOCHIN, iii. 440.
Triglochin maritimum, iii. 440.
—— *mexicanum*, iii. 440.
TRIGONIA, i. 65.
Trigonia, iv. 236, 313.
Trigonia floribunda, i. 65.
—— lævis, i. 65; iv. 9.
—— rigida, i. 65.
—— rugosa, i. 65.
TRIGONIDIUM, iii. 289.
Trigonidium egertonianum, iii. 289.
—— *ringens*, iii. 264.
—— seemannii, iii. 290.
TRIGONOSPERMUM, ii. 143.
Trigonospermum adenospermoides, ii. 143.
—— melampodioides, ii. 143.
Trimetra ficoidea, ii. 169.
TRIMEZIA, iii. 326.
Trimezia lurida, iii. 326.
—— *meridensis*, iii. 326.
TRIODIA, iii. 568.
Triodia, iv. 149.
Triodia avenacea, iii. 568.
—— mutica, iii. 569.
—— pulchella, iii. 569.
—— schaffneri, iii. 569.
—— texana, iii. 569.
TRIODON, ii. 55.
Triodon, iv. 102.
Triodon angulatum, ii. 55.
TRIOLÆNA, i. 422.
Triolæna hirsuta, i. 422.
—— scorpioides, i. 422.
TRIOPTERYS, i. 153.
Triopterys sericea, i. 157.
Triphasia trifoliata, i. 172.
TRIPLARIS, iii. 38.
Triplaris, iv. 84, 259.
Triplaris auriculata, iii. 38.
—— *columbiana*, iii. 38.
—— cumingiana, iii. 38.
Triplateia diffusa, i. 71.
Tripolium caricifolium, ii. 122.
TRIPSACUM, iii. 511.
Tripsacum, iv. 280.
—— *compressum*, iii. 511.
—— dactyloides, iii. 511.
—— *dactyloides*, iii. 512; iv. 279.
—— fasciculatum, iii. 512.
—— *lanceolatum*, iii. 511.
—— *monostachyum*, iii. 511.
Tripterocalyx micrantha, iii. 7.
TRISETUM, iii. 555.
Trisetum, iii. 554.
Trisetum bambusiforme, iii. 555.
—— *deyeuxioides*, iii. 554.
—— elongatum, iii. 555.
—— gracile, iii. 556.
—— *gracile*, iv. 297.
—— interruptum, iii. 556.
—— *interruptum*, iv. 297.
—— *molle*, iii. 556.
—— nivosum, iii. 556.
—— paniculatum, iii. 556.
—— *paniculatum*, iv. 297.
—— *subspicatum*, iii. 556.
—— tolucense, iii. 556.
—— *tolucense*, iv. 297.
—— *viride*, iii. 555.
—— virletii, iii. 556.
Trismeria argentea, iii. 679.
—— *aurea*, iii. 679.
—— *microphylla*, iii. 679.
TRISTACHYA, iii. 557.
Tristachya leiostachya, iii. 557.
—— *mexicana*, iii. 557.
TRISTEGINEÆ, iii. 515.
TRISTICHA, iii. 38.
Tristicha, iv. 231.
—— *bryoides*, iii. 39.
—— hypnoides, iii. 39; iv. 231.
Tristylium mexicanum, i. 93.
Trithrinax aculeata, iii. 411.
—— *warsewiczii*, iv. 165.
Triticum pilosum, iii. 585.
—— *scaberrimum*, iii. 584.
TRIUMFETTA, i. 137.
Triumfetta, iv. 144, 146, 147.
Triumfetta althæoides, i. 137.
—— bogotensis, i. 137.
—— *bogotensis*, i. 139.
—— botteriana, i. 137.
—— brachypetala, i. 137.
—— *dumetorum*, i. 137.
—— galeottiana, i. 137.
—— genuina, i. 137.
—— *grandiflora*, i. 138.
—— *havanensis*, i. 138.
—— heterophylla, i. 137.
—— hispida, i. 137.
—— josefina, i. 138.
—— lappula, i. 138; iv. 15.
—— lindeniana, i. 138.
—— longicuspis, i. 138.
—— *longicuspis*, i. 138.
—— *macrocalyx*, i. 138.
—— mollissima, i. 138.
—— obovata, i. 138.
—— orizabæ, i. 138.
—— oxyphylla, i. 138.
—— paniculata, i. 138.
—— *pilosa*, i. 137.
—— polyandra, i. 138.
—— semitriloba, i. 138; iv. 111.
—— speciosa, i. 138.
Triurideæ, iii. 437; iv. 198.
TRIXIS, ii. 257.
Trixis alata, ii. 258.
—— angustifolia, ii. 258.
—— conferta, ii. 258.
—— corymbosa, ii. 258.
—— decurrens, ii. 258.
—— frutescens, ii. 258.
—— *frutescens*, ii. 257.
—— glabra, ii. 258.
—— hænkei, ii. 258.
—— involucrata, ii. 258.

Trixis latifolia, ii. 257.
—— longifolia, ii. 258.
—— michuacana, ii. 258.
—— obvallata, ii. 258.
—— *patens*, ii. 256.
—— rosmarinifolia, ii. 259.
—— *seemannii*, ii. 257.
—— *turbinata*, ii. 257.
TRIZEUXIS, iii. 290.
Trizeuxis falcata, iii. 290.
Trochopteris, iii. 692.
Tromsdorffia canescens, iii. 21.
TROPÆOLUM, i. 162.
Tropæolum, i. 161.
—— *aduncum*, i. 162.
—— emarginatum, i. 162.
—— pendulum, i. 162.
—— peregrinum, i. 162.
—— *tuberosum*, i. 162.
TROPHIS, iii. 141.
Trophis americana, iii. 142.
—— glabrata, iii. 142.
—— mexicana, iii. 142.
—— *mexicana*, iii. 150.
—— ramon, iii. 142.
Tschudya sphondylantha, i. 427.
Tsuga douglasii, iii. 190.
—— *lindleyana*, iii. 190.
Tulipa, iii. 379.
TULIPEÆ, iii. 379.
Tulocarpus mexicanus, ii. 144.
Tupa laxiflora, iv. 66.
TURNERA, i. 474.
Turnera, iv. 119, 244.
Turnera alba, i. 474; iv. 39.
—— *angustifolia*, i. 475.
—— aphrodisiaca, i. 474; iv. 39.
—— *aurantiaca*, i. 475.
—— cærulea, i. 474; iv. 39.
—— callosa, iv. 39.
—— cistoides, i. 474; iv. 39.
—— *diffusa*, iv. 39.
—— ——, var. *β. aphrodisiaca*, iv. 39.
—— *elegans*, i. 474.
—— hindsiana, i. 474; iv. 39.
—— humifusa, i. 474; iv. 39.
—— mollis, i. 474; iv. 39.
—— *panamensis*, iv. 39.
—— pumila, i. 474.
—— trioniflora, i. 474.
—— ulmifolia, i. 475; iv. 112.
—— *ulmifolia*, iv. 233, 245.
—— ——, var., iv. 39.
—— ——, var. *angustifolia*, i. 475.
—— ——, var. *δ. elegans*, iv. 39.
—— ——, var. *ζ. velutina*, iv. 39.
Turnera ulmifolia, var. *μ. cærulea*, iv. 39.
—— velutina, i. 475; iv. 39.
TURNERACEÆ, i. 474; iv. 39.
Turneraceæ, iv. 181, 204, 217, 230, 233, 244.
TURPINIA, i. 215.
Turpinia, iv. 229.
Turpinia insignis, i. 215.
—— *insignis*, iv. 301.
—— *occidentalis*, i. 216.
—— paniculata, i. 216.
—— pinnata, i. 216.
—— tomentosa, i. 216.
—— *tomentosa*, ii. 72; iv. 24.
—— trioniflora, iv. 39.
Turritis hispida, i. 35.
—— patula, i. 30.
TUSSACIA, ii. 482.
Tussacia, iii. 324.
—— *aloides*, iii. 324.
—— friedrichsthaliana, ii. 482.
—— pulchella, ii. 482.
Tussilago, iv. 149.
Tyloderma præcelsa, i. 193.
Tympananthe suberosa, ii. 329.
TYPHA, iii. 416.
Typha angustifolia, iv. 93.
—— *angustifolia*, iii. 416.
—— domingensis, iv. 93.
—— *domingensis*, iii. 416.
—— latifolia, iii. 416.
—— truxillensis, iii. 416.
TYPHACEÆ, iii. 416; iv. 93.
Typhaceæ, iv. 198, 205, 217, 226.
Tyria myricæfolia, iii. 122.

Ugni friedrichsthalii, i. 410.
—— *montana*, i. 407.
—— *œrstedii*, i. 407, 410; iv. 157.
—— *warszewiczii*, i. 411.
Uhdea bipinnatifida, ii. 165.
Ulex europæus, i. 231.
ULMEÆ, iii. 138.
ULMUS, iii. 138.
Ulmus, iv. 309, 312.
Ulmus mexicana, iii. 138.
—— *mexicana*, iv. 147.
Ulva, iv. 148.
UMBELLIFERÆ, i. 557; iv. 45.
Umbelliferæ, iv. 182, 202, 215, 217, 225, 229, 231, 234, 248.
UMBELLULARIA, iii. 76.
Umbellularia californica, iv. 260.
—— parvifolia, iii. 77.
Umbilicaria, iv. 150.
Umbilicus galeottianus, i. 380.
—— *mexicanus*, i. 391.
UNCARIA, ii. 6.
Uncaria tomentosa, ii. 6.
UNCINIA, iii. 471.
Uncinia, iv. 234.
—— *jamaicensis*, iii. 471, 472.
—— mexicana, iii. 471.
—— *phleoides*, iii. 471.
UNGNADIA, i. 212.
Ungnadia speciosa, i. 212; iv. 23.
—— *speciosa*, iv. 141.
UNIOLA, iii. 578.
Uniola, iv. 280.
—— *effusa*, iii. 578.
—— *lugens*, iii. 578.
—— *mülleri*, iii. 578.
—— paniculata, iii. 578.
—— *prostrata*, iii. 578.
—— *pungens*, iii. 579.
—— *racemiflora*, iii. 578.
UNISEXUALES, iii. 88.
UNONA, i. 17.
Unona lucida, i. 20.
—— *penduliflora*, i. 18.
—— violacea, i. 17.
UNONEÆ, i. 17.
Unxia achillæoides, ii. 145, 213.
—— *digyna*, ii. 145.
—— *pratensis*, ii. 213.
Uralepis avenacea, iii. 568.
—— *mutica*, iii. 569.
—— *pulchella*, iii. 569.
Urananthus chironioides, ii. 348.
—— *glaucifolius*, ii. 348.
—— *pallidus*, ii. 348.
—— *russellianus*, ii. 349.
Uranthera recurva, i. 416.
Uraria, i. 286.
—— *hamosa*, i. 286.
URECHITES, ii. 317.
Urechites andrieuxii, ii. 317.
—— karwinskii, ii. 317.
URENA, i. 115.
Urena americana, i. 116.
—— grandiflora, i. 115.
—— hænkeana, i. 115.
—— *heterophylla*, i. 115.
—— lobata, i. 116.
Urenæ, i. 120.
URENEÆ, i. 115.
URERA, iii. 155.
Urera angustifolia, iii. 155.
—— *armigera*, iii. 155.
—— baccifera, iii. 155.
—— *baccifera*, iv. 293.
—— caracasana, iii. 155.

Urera caracasana, iv. 293.
—— corallina, iii. 155.
—— *densiflora*, iii. 155.
—— *denticulata*, iii. 155.
—— elata, iii. 156.
—— *girardinioides*, iii. 156.
—— horrida, iii. 155.
—— *jacquinii*, ζ. *corallina*, iii. 155.
—— laciniata, iii. 156.
—— microcarpa, iii. 156.
—— *platycarpa*, iii. 155.
—— tomentosa, iii. 155.
Urochloa uniseta, iii. 498, 506.
Uropappus grandiflorus, ii. 260.
—— *linearifolius*, ii. 260.
UROSKINNERA, ii. 447.
Uroskinnera hirtiflora, ii. 447.
—— spectabilis, ii. 447.
UROSPATHA, iii. 427.
Urospatha friedrichsthalii, iii. 428.
—— grandis, iii. 428.
Urostigma baccatum, iii. 144.
—— bonplandianum, iii. 144.
—— *botryapioides*, iii. 144.
—— *chiriquianum*, iii. 144.
—— *complicatum*, iii. 144.
—— *consanguineum*, iii. 144.
—— *costaricanum*, iii. 144.
—— *cotinifolium*, iii. 144.
—— *eugeniæfolium*, iii. 144.
—— *fuscescens*, iii. 145.
—— *glaucum*, iii. 145.
—— *glycicarpum*, iii. 145.
—— *guatemalanum*, iii. 145.
—— *intramarginale*, iii. 145.
—— *involutum*, iii. 145.
—— *lancifolium*, iii. 145.
—— *lapathifolium*, iii. 146.
—— *liebmannianum*, iii. 146.
—— *longipes*, iii. 146.
—— *myxæfolium*, iii. 146.
—— *nummularia*, iii. 146.
—— *nymphæifolium*, iii. 146.
—— *œrstedianum*, iii. 146.
—— *ovale*, iii. 146.
—— *padifolium*, iii. 147.
—— *petiolare*, iii. 147.
—— *populneum*, iii. 147.
—— *protensum*, iii. 147.
—— *sapidum*, iii. 147.
—— *scandens*, iii. 147.
—— *schiedeanum*, iii. 146.
—— *sulcipes*, iii. 148.
—— *tecolutense*, iii. 148.
—— *turbinatum*, iii. 148.
—— *verrucosa*, iii. 148.
—— *warscewiczii*, iii. 148.
URTICA, iii. 152.
Urtica, iv. 149.
Urtica angustifolia, iii. 153.
—— *aquatica*, iii. 153.
—— *baccifera*, iii. 155.
—— *berlandieri*, iii. 152.
—— *bovista*, iii. 153.
—— *caracasana*, iii. 155.
—— chamædryoides, iii. 152.
—— *chamædryoides*, iv. 293.
—— *corallina*, iii. 155.
—— dioica, iii. 153.
—— *dioica*, β. *angustifolia*, iii. 153.
—— *falcicrenata*, iii. 154.
—— flabellata, iii. 153.
—— genuina, iii. 152.
—— glandulifera, iii. 153.
—— *grandidentata*, iii. 155.
—— *hirta*, iii. 160.
—— latifolia, iii. 153.
—— *latifolia*, iii. 154.
—— ligulata, iii. 154.
—— mexicana, iii. 153.
—— mollis, iii. 153.
—— nicaraguensis, iii. 153.
—— *nicaraguensis*, iv. 293.
—— orizabæ, iii. 153.
—— *portulacina*, iii. 157.
—— procera, iii. 153.
—— *propinqua*, iii. 152.
—— *purpurascens*, iii. 152.
—— *pustulata*, iii. 154.
—— *serpyllacea*, iii. 158.
—— spiralis, iii. 154.
—— *spiralis*, iv. 293.
—— *stachydifolia*, iii. 152.
—— subincisa, iii. 154.
—— urens, iii. 154.
—— *verna*, iii. 152.
—— *verrucosa*, iii. 155.
—— vulgaris, iii. 153.
URTICACEÆ, iii. 138; iv. 87.
Urticaceæ, iv. 193, 202, 217, 226, 231.
URTICEÆ, iii. 152.
URVILLEA, i. 205; iv. 23.
Urvillea berteriana, i. 205.
—— *berteriana*, iv. 23.
—— dasycarpa, iv. 23.
—— mexicana, i. 205.
—— *mexicana*, iv. 23.
—— ulmacea, i. 205.
—— *ulmacea*, iv. 23.
Usnea, iv. 148, 159.
—— *barbata*, iv. 263.
—— *florida*, iv. 149.
Usteria antirrhiniflora, ii. 441.
—— *scandens*, ii. 442.
UTRICULARIA, ii. 469.
Utricularia andicola, ii. 469.
—— denticulata, ii. 469.
—— emarginata, ii. 469.
—— endresii, ii. 469; iv. 79.
—— foliosa, ii. 469.
—— gibba, ii. 470.
—— obtusa, ii. 470.
—— parkeriana, ii. 470.
—— pusilla, ii. 470.
—— secunda, ii. 470.
—— sinuata, ii. 470.
—— *subulata*, ii. 470.
—— vulgaris, ii. 470.
UVARIA, i. 15.
Uvaria, iv. 96.
Uvaria hahniana, i. 15.
—— *hahniana*, iv. 96.
UVARIEÆ, i. 14.
Uvularia, iii. 381.
UVULARIEÆ, iii. 381.

VACCINIACEÆ, ii. 271; iv. 66.
Vacciniaceæ, iv. 185, 203, 225, 254.
VACCINIUM, ii. 274.
Vaccinium, iv. 148, 157, 158, 254.
Vaccinium angustifolium, ii. 274.
—— *brachystachyum*, ii. 274.
—— *caracasanum*, ii. 275.
—— confertum, ii. 274.
—— *confertum*, iv. 289.
—— consanguineum, ii. 274.
—— *consanguineum*, iv. 156.
—— cordatum, ii. 274.
—— *densiflorum*, iv. 159.
—— discolor, ii. 274.
—— *discolor*, iv. 289.
—— *elevatum*, ii. 275.
—— eriocladum, ii. 274.
—— geminiflorum, ii. 274.
—— *geminiflorum*, iv. 289, 305.
—— kunthianum, ii. 275.
—— leucanthum, ii. 275.
—— *meridionale*, ii. 274.
—— micranthum, ii. 275.
—— pachyphyllum, ii. 275.
—— schlechtendalii, ii. 275.
—— secundum, ii. 275.
—— *stamineum*, ii. 275.
—— villosum, ii. 275.
Valantia hypocarpia, ii. 63.
VALERIANA, ii. 67.
Valeriana, iv. 149.
Valeriana affinis, ii. 67.
—— *affinis*, iv. 287.
—— barbareæfolia, ii. 67.
—— *barbareæfolia*, iv. 287.

Valeriana candolleana, ii. 67.
—— ceratophylla, ii. 68.
—— densiflora, ii. 68.
—— denudata, ii. 68.
—— galeottiana, ii. 68.
—— *galeottiana*, ii. 67.
—— laciniosa, ii. 68.
—— latifolia, ii. 68.
—— mexicana, ii. 68.
—— mikania, iv. 48.
—— napus, ii. 68.
—— phaseoli, ii. 68.
—— pilosiuscula, ii. 68.
—— procera, ii. 68.
—— pulchella, ii. 68.
—— ramosissima, ii. 68.
—— *ramosissima*, iv. 287.
—— scandens, ii. 68.
—— scorpioides, ii. 69.
—— sorbifolia, ii. 69; iv. 48.
—— subincisa, ii. 69.
—— tolucana, ii. 69.
—— *tolucana*, ii. 67.
—— urticæfolia, ii. 69.
—— vaginata, ii. 69.
—— *vaginata*, iv. 287.
VALERIANACEÆ, iv. 48.
Valerianaceæ, iv. 225.
VALERIANEÆ, ii. 67.
Valerianeæ, iv. 182, 204.
VALLESIA, ii. 306.
Vallesia chiococcoides, ii. 306.
—— *cymbæfolia*, ii. 306.
—— *dichotoma*, ii. 306.
—— glabra, ii. 306; iv. 113.
—— *glabra*, iv. 233.
—— mexicana, ii. 306.
Vallisneria spiralis, iii. 196.
VANDEÆ, iii. 248.
Vandeæ, iv. 195.
VANDELLIA, ii. 452.
Vandellia diffusa, ii. 452.
—— *diffusa*, iv. 231.
VANGUERIEÆ, ii. 45.
VANILLA, iii. 294.
Vanilla inodora, ii. 294.
—— pfaviana, iv. 90.
—— planifolia, iii. 294.
—— *planifolia*, iv. 269.
—— pompona, iii. 294.
—— sativa, iii. 294.
—— sylvestris, iii. 294.
Varennea polystachya, iv. 95.
VARILLA, ii. 161.
Varilla mexicana, ii. 161.
Varronia calyptrata, ii. 366.
—— *rotundifolia*, ii. 369.
Vasconcellea boissieri, i. 481.
—— *peltata*, i. 481.
VASCULARES, iii. 589.
VAUQUELINIA, i. 370.
Vauquelinia, iv. 240.
Vauquelinia corymbosa, i. 370; iv. 34.
—— karwinskyi, i. 370.
—— torreyi, i. 370.
Velæa decumbens, i. 564.
—— *toluccensis*, i. 564.
Velasquezia melanodendron, iv. 84.
VERATREÆ, iii. 381.
Veratrum caricifolium, iii. 383.
—— *frigidum*, iii. 381; iv. 150.
—— *officinale*, iii. 383.
—— *tenuifolium*, iii. 383.
—— *virescens*, iii. 382.
Verbascum, ii. 440.
—— *blattaria*, ii. 440.
—— *thaspus*, ii. 440.
VERBENA, ii. 533.
Verbena, ii. 527; iv. 163.
—— *affinis*, ii. 534.
—— andrieuxii, ii. 533.
—— arizonica, iv. 80.
—— aubletia, ii. 533.
—— barbata, ii. 533.
—— *biserrata*, ii. 534.
—— *bonariensis*, ii. 533.
—— *bracteata*, ii. 533.
—— bracteosa, ii. 533.
—— *cærulea*, ii. 535.
—— canescens, ii. 533.
—— caroliniana, ii. 534.
—— *caroliniana*, iv. 149.
—— ciliata, ii. 534.
—— delicatula, ii. 534.
—— ehrenbergiana, ii. 534.
—— elegans, ii. 534.
—— exilis, ii. 534.
—— *gracilis*, ii. 533.
—— *hirsuta*, ii. 534.
—— *jamaicensis*, ii. 532.
—— *lamberti*, ii. 533.
—— ——, var. *rosea*, ii. 533.
—— *lappulacea*, ii. 532.
—— *ligustrina*, ii. 530.
—— littoralis, ii. 534.
—— longifolia, ii. 534.
—— *menthæfolia*, ii. 535.
—— *mexicana*, ii. 533.
—— *moranensis*, ii. 534.
—— *mutabilis*, ii. 532.
—— *nodiflora*, ii. 530.
—— officinalis, ii. 535.
—— *officinalis*, ii. 533.
Verbena paucifolia, ii. 534.
—— *polystachya*, ii. 534.
—— *prismatica*, ii. 531.
—— *pulchella*, iv. 149.
—— *recta*, ii. 534.
—— *remota*, ii. 533.
—— rhinanthifolia, ii. 535.
—— *setosa*, ii. 535.
—— *squamosa*, ii. 501.
—— *supina*, ii. 533.
—— teucriifolia, ii. 535.
—— *teucriifolia*, iv. 292.
—— trifida, ii. 535.
—— urticæfolia, ii. 535.
—— *veronicæfolia*, ii. 534.
—— wrightii, iv. 80.
—— xutha, ii. 535; iv. 80.
VERBENACEÆ, ii. 527; iv. 80, 106.
Verbenaceæ, iv. 189, 202, 217, 225.
VERBESINA, ii. 187; iv. 57.
Verbesina, iv. 213, 251.
Verbesina alata, ii. 187.
—— argentea, ii. 187.
—— *atriplicifolia*, ii. 164.
—— *aurea*, ii. 172.
—— auriculata, ii. 187.
—— capitaneja, ii. 187.
—— *ceanothifolia*, ii. 172.
—— coahuilensis, iv. 57.
—— conyzoides, ii. 190.
—— coulteri, iv. 57.
—— crocata, ii. 187.
—— encelioides, ii. 187.
—— fraseri, ii. 187.
—— gigantea, ii. 188.
—— grayi, ii. 188.
—— hypoleuca, ii. 188.
—— longipes, ii. 188.
—— microcephala, ii. 188.
—— *microcephala*, iv. 156.
—— mollis, ii. 188.
—— neriifolia, ii. 188.
—— *nicaraguensis*, ii. 190.
—— oaxacana, ii. 189.
—— œrstediana, ii. 189.
—— *œrstediana*, iv. 288.
—— ovatifolia, ii. 189; iv. 57.
—— pallens, ii. 189.
—— pauciflora, ii. 189.
—— persicifolia, ii. 189.
—— pinnatifida, ii. 190.
—— podocephala, ii. 190.
—— pterocaula, ii. 190.
—— salicifolia, ii. 190.
—— *scabra*, ii. 186.
—— seemannii, ii. 190.

Verbesina sericea, ii. 190.
—— serrata, ii. 190.
—— sororia, ii. 190.
—— sublobata, ii. 190.
—— virgata, ii. 190.
—— virginica, var. palmeri, iv. 57.
—— wrightii, iv. 58.
VERNONIA, ii. 70.
Vernonia, iv. 213, 252.
Vernonia acilepis, ii. 70.
—— alamani, ii. 70.
—— *alamani*, ii. 73.
—— *andrieuxii*, ii. 231.
—— *andromachioides*, ii. 231.
—— angustifolia, ii. 71.
—— *angustifolia*, ii. 75.
—— arborescens, ii. 71.
—— *arborescens*, ii. 75.
—— arctioides, ii. 71.
—— *argyropappa*, ii. 73.
—— aschenborniana, ii. 71.
—— barbinervis, ii. 71.
—— bolleana, ii. 71.
—— brachiata, ii. 71.
—— bullata, ii. 71.
—— canescens, ii. 71.
—— callilepis, ii. 74.
—— cordata, ii. 71.
—— corymbiformis, ii. 71.
—— deppeana, ii. 71.
—— ehrenbergiana, ii. 71.
—— evendbergii, iv. 49.
—— foliosa, ii. 72.
—— *foliosa*, ii. 73, 74.
—— fragrans, ii. 72.
—— *geminiflora*, ii. 73.
—— greggii, iv. 49.
—— ——, var. palmeri, iv. 49.
—— hypoleuca, ii. 72.
—— inuloides, ii. 72.
—— karwinskiana, ii. 72.
—— lanceolaris, ii. 72.
—— leiboldiana, ii. 72.
—— leiocarpa, ii. 72.
—— liatroides, ii. 72.
—— *liatroides*, iv. 49.
—— mexicana, ii. 72.
—— monosis, ii. 72; iv. 24.
—— *monosis*, ii. 73.
—— odoratissima, ii. 73.
—— pallens, ii. 73.
—— paniculata, ii. 73.
—— *paniculata*, ii. 72.
—— patens, ii. 73.
—— pœppigiana, ii. 73.
—— punctata, ii. 73.
—— rubricaulis, ii. 73.
Vernonia salicifolia, ii. 73.
—— *salicifolia*, ii. 72, 74.
—— salvinæ, ii. 73.
—— scabra, ii. 74.
—— schaffneri, iv. 49.
—— schiedeana, ii. 74.
—— seemanniana, ii. 74.
—— serratuloides, ii. 74.
—— sinclairii, ii. 74.
—— steetzii, ii. 74.
—— *steetzii*, ii. 72, 73.
—— stellaris, ii. 74.
—— tarchonanthifolia, ii. 74.
—— toluccana, ii. 74.
—— triantha, ii. 74.
—— triflosculosa, ii. 74.
—— uniflora, ii. 75.
—— *virens*, ii. 75.
VERNONIACEÆ, ii. 70.
Vernoniaceæ, iv. 183.
VERONICA, ii. 455.
Veronica agrestis, ii. 455.
—— peregrina, ii. 455.
—— serpyllifolia, ii. 455.
—— *serpyllifolia*, iv. 149, 150, 291.
—— *xalapensis*, ii. 455.
Vesalea floribunda, ii. 5.
—— *hirsuta*, ii. 5.
VESICARIA, i. 32.
Vesicaria, iv. 142.
Vesicaria argentea, i. 33.
—— argyræa, i. 32.
—— *argyræa*, iv. 5.
—— densiflora, i. 33.
—— fendleri, iv. 5.
—— *ludoviciana*, i. 33.
—— purpurea, i. 33; iv. 5.
—— recurvata, i. 33; iv. 5.
—— schaffneri, iv. 5.
—— stenophylla, i. 33.
—— *stenophylla*, iv. 5.
Viborquia, i. 235.
—— *polystachya*, iv. 95.
VIBURNUM, ii. 2.
Viburnum, iv. 147, 149, 248.
Viburnum acutifolium, ii. 2.
—— *acutifolium*, iv. 286.
—— costaricanum, ii. 2.
—— *costaricanum*, iv. 286.
—— densum, ii. 2.
—— discolor, ii. 2.
—— elatum, ii. 2.
—— fuscum, ii. 2.
—— glabratum, ii. 2.
—— hartwegii, ii. 2.
—— membranaceum, ii. 2; iv. 46.
—— microcarpum, ii. 2.
Viburnum microphyllum, ii. 3.
—— *microphyllum*, iv. 287.
—— parviflorum, ii. 3.
—— rhombifolium, ii. 3.
—— *rhombifolium*, iv. 287.
—— stellato-pilosum, ii. 3.
—— stellato-tomentosum, ii. 3.
—— *stellato-tomentosum*, iv. 287.
—— stellatum, ii. 3.
—— *stellatum*, iv. 287.
—— stenocalyx, ii. 3.
—— sulcatum, ii. 3.
—— tiliæfolium, ii. 3.
—— wendlandi, ii. 3.
VICIA, i. 291.
Vicia americana, var. linearis, iv. 30.
—— exigua, i. 292.
—— humilis, i. 292.
—— mexicana, i. 292.
—— pedunculata, i. 292.
—— pulchella, i. 292.
—— *pulchella*, iv. 284.
—— sativa, i. 292.
—— setifolia, i. 292.
VICIEÆ, i. 291.
Vieusseuxia martinicensis, iii. 326.
VIGNA, i. 309.
Vigna brachystachys, i. 309.
—— *lutea*, i. 309.
—— luteola, i. 309; iv. 112.
—— vexillata, i. 309.
—— *villosa*, i. 309.
VIGUIERA, ii. 177.
Viguiera acuminata, ii. 176.
—— *brevipes*, ii. 178.
—— buddleiæformis, ii. 177.
—— canescens, ii. 177; iv. 56.
—— cordifolia, ii. 177.
—— dentata, ii. 177.
—— excelsa, ii. 177.
—— ghiesbreghtii, iv. 56.
—— grammatoglossa, ii. 178.
—— helianthoides, ii. 178; iv. 56, 113.
—— *laxa*, ii. 178.
—— linearis, ii. 178.
—— *macrophylla*, ii. 176.
—— *nivea*, iv. 57.
—— oppositipes, ii. 178.
—— pachycephala, ii. 178.
—— prostrata, ii. 178.
—— rugosa, ii. 178.
—— seemannii, ii. 178; iv. 56.
—— sessilifolia, ii. 178.
—— sphærocephala, ii. 179.
—— *tephrodes*, iv. 57.
—— *texana*, ii. 178.

Viguiera triquetra, ii. 179.
—— urticiformis, ii. 179.
Vilfa, iii. 545, 547, 548; iv. 148.
—— *arachnoidea*, iii. 541.
—— *arguta*, iii. 546.
—— *atrovirens*, iii. 545.
—— *ciliata*, iii. 545.
—— *confusa*, iii. 547.
—— *cryptandra*, iii. 545.
—— *densiflora*, iii. 547.
—— *domingensis*, iii. 545.
—— *dulcis*, iii. 552.
—— *eminens*, iii. 545.
—— *exilis*, iii. 546.
—— *grisebachiana*, iii. 547.
—— *humifusa*, iii. 546.
—— *liebmanni*, iii. 548.
—— *minutiflora*, iii. 546.
—— *mülleri*, iii. 547.
—— *noterophila*, iii. 546.
—— *orizabæ*, iii. 548.
—— *plumbea*, iii. 546.
—— *pubescens*, iii. 548.
—— *purpurascens*, iii. 547.
—— *ramulosa*, iii. 547.
—— *repens*, iii. 547.
—— *rupestris*, iii. 546.
—— *sacatilla*, iii. 548.
—— *tenacissima*, iii. 546.
—— *virginica*, iii. 547.
VILLAMILLA, iii. 28.
Villamilla octandra, iii. 29.
VILLANOVA, ii. 213.
Villanova achillæoides, ii. 213.
—— *bipinnatifida*, ii. 148.
—— *oppositifolia*, ii. 213.
—— pratensis, ii. 213.
Villarsia humboldtiana, ii. 353.
VINCETOXICUM, ii. 328.
Vincetoxicum, iv. 254.
Vincetoxicum kunthii, ii. 328.
—— *kunthii*, iv. 70.
—— mexicanum, iv. 69.
—— sepium, ii. 328.
VIOLA, i. 49.
Viola, iv. 150, 158.
Viola barroetana, i. 49.
—— ciliata, i. 49.
—— *ciliata*, i. 50, 51; iv. 283.
—— *dichotoma*, i. 51.
—— flagelliformis, i. 49; iv. 8.
—— grahami, i. 50.
—— *grahami*, i. 49.
—— hookeriana, i. 50.
—— *hookeriana*, i. 49.
—— humilis, i. 50.
—— *humilis*, iv. 283.
Viola latistipula, i. 50.
—— *latistipula*, iv. 8.
—— *magellanica*, i. 52.
—— nannei, i. 51.
—— *odorata*, i. 51.
—— pteropoda, i. 51.
—— pubescens, i. 51.
—— *pubescens*, iv. 8.
—— reticulata, i. 51.
—— scandens, i. 51.
—— striata, i. 51.
—— umbraticola, i. 51.
—— *umbraticola*, iv. 283.
Violaceæ, iv. 203.
VIOLARIEÆ, i. 48; iv. 8.
Violarieæ, iv. 173, 216, 224.
VIOLEÆ, i. 48.
Virgilia secundiflora, i. 321.
Viscum, iv. 148, 159, 263.
—— *bolleanum*, iii. 84.
—— *brachystachyum*, iii. 85.
—— *falcatum*, iii. 84.
—— *flavens*, iii. 85.
—— *hexastichum*, iii. 85.
—— *kunthianum*, iii. 86.
—— *latifolium*, iii. 85.
—— *reichenbachianum*, iii. 86.
—— *rubrum*, iii. 86.
—— *schiedeanum*, iii. 84.
—— *squamigerum*, iii. 86.
—— *teretifolium*, iii. 85.
—— *tomentosum*, iii. 86.
—— *vaginatum*, iii. 83.
—— *velutinum*, iii. 87.
VISMIA, i. 84.
Vismia, iv. 230.
—— *baccifera*, i. 84.
—— billbergiana, i. 84.
—— dealbata, i. 84.
—— *guianensis*, i. 84.
—— latifolia, i. 84.
—— macrophylla, i. 84; iv. 12.
—— mexicana, i. 84.
—— panamensis, i. 84.
—— viridiflora, i. 84.
VITEX, ii. 539.
Vitex flavens, ii. 539.
—— floridula, ii. 539.
—— gigantea, ii. 539.
—— *lasiophylla*, ii. 539.
—— mollis, ii. 539.
VITIS, i. 202.
Vitis, iv. 262.
Vitis acapulcensis, i. 202.
—— acuminata, i. 202.
—— æstivalis, i. 202; iv. 22.
—— arachnoidea, i. 203.
Vitis bipinnata, i. 203.
—— californica, i. 203.
—— *caribæa*, i. 203, 204.
—— chontalensis, iv. 23.
—— cordifolia, iv. 23.
—— elliptica, i. 203.
—— erosa, i. 203.
—— incisa, i. 203.
—— *incisa*, iv. 141.
—— indica, i. 203.
—— javalensis, iv. 23.
—— mexicana, i. 203.
—— monstrosa, i. 204.
—— obtusata, i. 204.
—— ovata, i. 204.
—— pubescens, i. 203; iv. 23.
—— quinquefolia, i. 203.
—— rotundifolia, i. 203.
—— sicyoides, i. 203.
—— *sicyoides*, i. 204.
—— smilacina, i. 204.
—— tamoides, i. 204.
—— tiliacea, i. 204.
—— tiliæfolia, i. 204; iv. 98, 111.
—— trifoliata, i. 204.
—— tuberosa, i. 204.
—— *vulpina*, i. 203, 204.
VITTARIA, iii. 681.
Vittaria angustifrons, iii. 681.
—— *costata*, iii. 681.
—— *filifolia*, iii. 681.
—— *graminifolia*, iii. 681.
—— lineata, iii. 681; iv. 116.
—— scabrida, iii. 681.
VOCHYSIA, i. 65.
Vochysia, iv. 236, 313.
Vochysia ferruginea, i. 65.
—— *ferruginea*, iv. 236.
—— *tomentosa*, i. 65.
VOCHYSIACEÆ, i. 65; iv. 9.
Vochysiaceæ, iv. 173, 205, 216, 236.
Volkameria aculeata, ii. 540.
—— *ligustrina*, ii. 540.
VOYRIA, ii. 344.
Voyria, iv. 231, 255.
Voyria mexicana, ii. 344.
—— simplex, ii. 344.
Vriesia, iii. 319.
—— *incurvata*, iii. 319.
—— *malzinei*, iii. 321.
—— ringens, iii. 322.
—— *viminalis*, iii. 323.
—— *xyphostachys*, iii. 320.
Vulpia muralis, iii. 582.

Wahlbomia, i. 12.
WALTHERIA, i. 132.

Waltheria americana, i. 132; iv. 111.
—— ——, var., iv. 111.
—— brevipes, i. 132.
—— detonsa, i. 132.
—— glomerata, i. 132.
—— hirsuta, i. 132.
—— *indica*, i. 132.
—— preslii, i. 132.
—— *rotundifolia*, i. 132.
Waria, i. 20.
Warrea discolor, iii. 251.
—— *marginata*, iii. 251.
—— *quadrata*, iii. 251.
Warscewiczella aromatica, iii. 251.
—— bidentatum, iii. 251.
—— *discolor*, iii. 251.
—— *marginata*, iii. 251.
—— *quadrata*, iii. 251.
WARSCEWICZIA, ii. 15.
Warscewiczia coccinea, ii. 15.
—— *coccinea*, ii. 16.
—— pulcherrima, ii. 16.
Washingtonia filifera, iv. 277.
Webera, iv. 149.
WEDELIA, ii. 169.
Wedelia, iii. 4.
Wedelia acapulcensis, ii. 170.
—— *aurea*, ii. 172.
—— carnosa, ii. 170; iv. 103, 112.
—— *cordata*, ii. 163.
—— *discoidea*, ii. 171.
—— filipes, ii. 170.
—— frutescens, ii. 170.
—— hispida, ii. 170.
—— paludosa, ii. 170.
—— phyllocephala, ii. 170.
—— populifolia, ii. 171.
—— *strigosa*, ii. 171.
—— *subflexuosa*, ii. 163.
WEINMANNIA, i. 385.
Weinmannia glabra, i. 385.
—— intermedia, i. 385.
—— *pinnata*, i. 385.
WELDENIA, iii. 397.
Weldenia candida, iii. 397.
—— *candida*, iv. 296.
—— *schultesii*, iii. 397.
WELFIA, iii. 410.
Welfia, iv. 276.
Welfia georgii, iii. 410.
Welwitschia mirabilis, iii. 182.
Wenderothia, i. 303.
—— *discolor*, i. 303.
—— *glabra*, i. 303.
—— *hirsuta*, i. 303.
—— *pilosa*, i. 303.
WETTINIA, iii. 401.
Wiborgia urticæfolia, ii. 161.
WIGANDIA, ii. 359.
Wigandia, iv. 255.
Wigandia caracasana, ii. 360.
—— kunthii, ii. 360.
—— macrophylla, ii. 360.
—— scorpioides, ii. 360.
—— urens, ii. 360.
Willdenovia, ii. 16.
—— *glandulosa*, ii. 218.
WIMMERIA, i. 191.
Wimmeria concolor, i. 191.
—— *concolor*, i. 192.
—— confusa, i. 192.
—— discolor, i. 192.
—— *pallida*, i. 192.
—— persicifolia, i. 192.
—— pubescens, i. 192.
WINTEREÆ, i. 14.
Wirtgenia mexicana, ii. 171.
—— *texana*, ii. 170.
WISLIZENIA, i. 43.
Wislizenia refracta, i. 43.
WISSADULA, i. 107.
Wissadula excelsior, i. 108.
—— *gymnostachya*, i. 108.
—— *jamesonii*, i. 108.
—— mucronulata, i. 108.
—— nudiflora, i. 108.
—— rostrata, i. 108.
—— scabra, i. 108.
—— spicata, i. 108; iv. 14.
Withania coronopus, ii. 421.
—— *sordida*, ii. 421.
—— *xalapensis*, ii. 422.
Witheringia diversifolia, ii. 423.
—— *stramonifolia*, ii. 424.
Wittelsbachia, i. 55.
WOLFFIA, iii. 437.
Wolffia, iii. 435; iv. 134.
Woffia columbiana, iii. 437.
—— *columbiana*, iii. 436.
—— gladiata, iii. 437.
—— *gladiata*, iii. 436.
—— lingulata, iii. 437.
—— *lingulata*, iii. 436.
WOODSIA, iii. 595.
Woodsia, iv. 148.
—— *canescens*, iii. 595, 596.
—— *fragilis*, iii. 595, 596.
—— *guatemalensis*, iii. 595.
—— *mexicana*, iii. 595, 596.
—— mollis, iii. 595.
—— *pusilla*, iii. 595.
WOODWARDIA, iii. 628.
Woodwardia radicans, iii. 629.
—— *radicans*, *β. mexicana*, iii. 629.
Woodwardia spinulosa, iii. 629.
WULFIA, ii. 167.
Wulfia platyglossa, ii. 167.

XANTHIUM, ii. 151.
Xanthium macrocarpum, ii. 151.
—— spinosum, ii. 152.
XANTHOCEPHALUM, ii. 109.
Xanthocephalum, iv. 51.
Xanthocephalum alamani, ii. 109.
—— benthamianum, ii. 110.
—— *bonplandianum*, ii. 110.
—— centauroides, ii. 110.
—— *centauroides*, ii. 109, 111.
—— conoideum, ii. 110.
—— dentatum, ii. 111.
—— gymnospermoides, ii. 111.
—— humile, ii. 111.
—— sericocarpum, ii. 111.
—— suffruticosum, ii. 111.
Xanthocoma, ii. 109.
—— *humilis*, ii. 111.
Xanthocromyon herberti, iii. 326.
XANTHOSOMA, iii. 418.
Xanthosoma, iv. 278.
—— *cubense*, iii. 418, 419.
—— helleborifolium, iii. 418.
—— hoffmannii, iii. 418.
—— jacquini, iii. 418.
—— pedatum, iii. 418.
—— pilosum, iii. 419.
—— mexicanum, iii. 418.
—— robustum, iii. 419.
—— roseum, iii. 419.
—— sagittifolium, iii. 419.
—— *sagittifolium*, iii. 418.
—— *undipes*, iii. 418.
—— wendlandii, iii. 418.
XEROCOCCUS, ii. 32.
Xerococcus congestus, ii. 32.
Xerotideæ, iv. 226.
Xestæa lisianthoides, ii. 348.
Ximenesia cordata, ii. 183; iv. 57.
—— encelioides, ii. 187.
—— *fœtida*, ii. 184.
—— *heterophylla*, ii. 184.
—— *hispida*, ii. 184.
XIMENIA, i. 185.
Ximenia americana, i. 185.
—— *multiflora*, i. 185.
—— *oblonga*, i. 185.
—— parviflora, i. 185.
XIPHIDIUM, iii. 325.
Xiphidium albidum, iii. 325.
—— *album*, iii. 325.
—— *cæruleum*, iii. 325.
—— floribundum, iii. 325.

Xiphidium giganteum, iii. 325.
Xiphopteris myosuroides, iii. 669.
—— *serrulata*, iii. 669.
XYLOBIUM, iii. 252.
Xylobium brachypus, iii. 252.
—— concavum, iii. 252.
—— elongatum, iii. 252.
—— stachyobiorum, iii. 252.
—— *stachyobiorum*, iv. 295.
Xylodalea megacarpa, iv. 27.
XYLOPIA, i. 20.
Xylopia frutescens, i. 20.
—— grandiflora, i. 20.
—— longifolia, i. 20.
—— trunciflora, i. 20.
XYLOPIEÆ, i. 18.
Xylopleurum berlandieri, i. 453.
—— *hirsutum*, i. 453.
XYLOSMA, i. 57.
Xylosma cinerea, i. 57.
—— elliptica, i. 57.
—— flexuosa, i. 57.
—— intermedia, i. 57.
—— lanceolata, i. 57.
—— nitida, i. 57.
—— panamensis, i. 57.
—— ——, var.?, i. 58.
—— seemanni, i. 57.
Xylosteum mexicanum, ii. 5.
Xyrideæ, iv. 197.

YUCCA, iii. 369.
Yucca, iv. 140, 141, 146, 214, 272, 273, 274, 307, 309.
—— *acrotricha*, iii. 373.
—— *albospica*, iii. 370.
—— aloifolia, iii. 369.
—— *aloifolia*, iv. 273.
—— angustifolia, iii. 370.
—— *angustifolia*, *β. elata*, iii. 370.
—— *arcuata*, iii. 370.
—— *aspera*, iii. 371.
—— baccata, iii. 370.
—— boerhaavii, iii. 370.
—— *canaliculata*, iii. 371.
—— *conspicua*, iii. 370.
—— constricta, iii. 370.
—— *crenulata*, iii. 370.
—— desmetiana, iii. 370.
—— *draconis*, iii. 370.
—— *ensifolia*, iii. 370.
—— *filifera*, iii. 370.
—— flexilis, iii. 370.
—— funifera, iii. 370.
—— gigantea, iii. 371.
—— *gloriosa*, iv. 147.
—— *graminifolia*, iii. 374.
Yucca guatemalensis, iii. 371.
—— *longifolia*, iii. 372.
—— *lutescens*, iii. 371.
—— peacockii, iii. 371.
—— *polyphylla*, iii. 370.
—— rupicola, iii. 371.
—— *serrulata*, iii. 370.
—— schottii, iii. 371.
—— *stricta*, iii. 370.
—— *tenuifolia*, iii. 370.
—— treculeana, iii. 371.
—— yucatana, iii. 371.

ZALUZANIA, ii. 159.
Zaluzania, ii. 206.
Zaluzania angusta, ii. 159.
—— asperrima, ii. 159.
—— *cinerascens*, ii. 161.
—— coulteri, ii. 159.
—— *ensifolia*, ii. 161.
—— globosa, ii. 159.
—— *megacephala*, ii. 159.
—— mollissima, ii. 160.
—— montagnæfolia, ii. 160.
—— *myriophylla*, ii. 159.
—— *pinnatilobata*, ii. 163.
—— *squarrosa*, ii. 163.
—— triloba, ii. 160; iv. 55.
ZAMIA, iii. 193.
Zamia, iv. 300, 301.
Zamia acuminata, iii. 194.
—— *atropurpurea*, iii. 192.
—— *caracasana*, iii. 195.
—— chigua, iii. 194.
—— cycadifolia, iii. 195.
—— *cylindrica*, iii. 195.
—— *eriolepis*, iii. 195.
—— fischeri, iii. 194.
—— *friderici-guilielmi*, iii. 191.
—— furfuracea, iii. 194.
—— *galeottii*, iii. 193.
—— latifolia, iii. 194.
—— lawsoniana, iii. 195.
—— leiboldii, iii. 195.
—— *leiboldii*, iii. 191.
—— ——, var. *angustifolia*, iii. 195.
—— *lindleyana*, iii. 194.
—— *lindleyi*, iii. 194.
—— loddigesii, iii. 194.
—— *loddigesii*, var. *leiboldii*, iii. 195.
—— *macrophylla*, iii. 193.
—— *mæleni*, iii. 191.
—— media, iii. 195.
—— *mexicana*, iii. 195.
—— *muricata*, iii. 194.
—— ——, var. *obtusifolia*, iii. 194.
—— ——, var. *picta*, iii. 194.
Zamia obliqua, iii. 194.
—— ottonis, iii. 194.
—— picta, iii. 194.
—— *prasina*, iii. 194.
—— *princeps*, iii. 194.
pseudo-parasitica, iii. 193.
—— *roezlii*, iii. 193.
—— *serrulata*, iii. 195.
—— skinneri, iii. 193.
—— spartea, iii. 195.
—— *tenuis*, iii. 195.
—— *terrestris*, iii. 195.
Zannichellia, iii. 440.
ZANTHOXYLEÆ, i. 168.
ZANTHOXYLON, i. 168.
Zanthoxylon affine, i. 168.
—— *araliaceum*, i. 171.
—— ghiesbreghtii, i. 168.
—— limoncillo, i. 168.
—— melanostictum, i. 168.
—— pentanome, i. 169.
—— pterota, i. 169; iv. 97.
—— *pterota*, i. 168.
—— rigidum, i. 169.
Zapania mexicana, ii. 533.
—— *nodiflora*, ii. 530.
ZAUSCHNERIA, i. 463.
Zauschneria californica, i. 463.
—— *mexicana*, i. 463.
ZEA, iii. 513.
Zea, iv. 279.
Zea mays, iii. 513.
ZEBRINA, iii. 397.
Zebrina leiandra, iii. 393.
—— pendula, iii. 397.
ZEPHYRANTHES, iii. 332.
Zephyranthes, iv. 231.
—— *ackermannia*, iii. 333.
—— *aurea*, iii. 333.
—— carinata, iii. 332.
—— concolor, iii. 332.
—— *grahamiana*, iii. 333.
—— *grandiflora*, iii. 332, 333.
—— *lilacina*, iii. 333.
—— *lindleyana*, iii. 333.
—— longifolia, iii. 333.
—— nervosa, iii. 333.
—— pallida, iii. 333.
—— sessilis, iii. 333.
—— *striata*, iii. 333.
—— *verecunda*, iii. 333.
Zetocapnia, iii. 337.
ZEUGITES, iii. 576.
Zeugites, iii. 577; iv. 280.
—— *americana*, iii. 577.
—— galeottiana, iii. 577.
—— hartwegi, iii. 577.

Zeugites latifolia, iii. 577.
—— mexicana, iii. 577.
—— munroana, iii. 577.
ZEXMENIA, ii. 171.
Zexmenia, ii. 175; iv. 213, 251.
Zexmenia aurea, ii. 172.
—— brevifolia, ii. 172; iv. 56.
—— *brevifolia*, iv. 141.
—— ceanothifolia, ii. 172.
—— costaricensis, ii. 172.
—— crocea, ii. 172.
—— *crocea*, iv. 56.
—— *encelioides*, iv. 141.
—— fasciculata, ii. 172.
—— ghiesbreghtii, ii. 172.
—— gnaphalioides, ii. 172.
—— *grayi*, ii. 188.
—— greggii, ii. 172.
—— helianthoides, ii. 172.
—— imbricata, ii. 173.
—— lantaniæfolia, ii. 173.
—— lindenii, ii. 173.
—— longipes, ii. 173.
—— macrocephala, ii. 173.
—— microcephala, ii. 173.
—— monocephala, ii. 173.
—— ovata, ii. 173.
—— *salmeoides*, ii. 191.
—— salvinii, ii. 173.
—— scandens, ii. 174; iv. 56.
—— seemannii, ii. 174.
—— serrata, ii. 174.
—— stenantha, ii. 174; iv. 56.
—— strigosa, ii. 174.
—— tagetiflora, ii. 175.
—— *texana*, ii. 170.
—— trachylepis, ii. 175.
Zexmenia villosa, ii. 175.
—— zinnioides, ii. 175.
Zigadenus, iii. 382.
ZINGIBEREÆ, iii. 308.
ZINNIA, ii. 152.
Zinnia, ii. 153; iv. 140.
Zinnia acerosa, ii. 152; iv. 55.
—— angustifolia, ii. 153.
—— anomala, ii. 153; iv. 55.
—— bicolor, ii. 153.
—— *bicuspis*, ii. 152.
—— elegans, ii. 153.
—— *elegans*, ii. 154.
—— grandiflora, ii. 153.
—— intermedia, ii. 153.
—— juniperifolia, ii. 153; iv. 55.
—— leptopoda, ii. 153.
—— linearis, ii. 154.
—— maritima, ii. 154.
—— multiflora, ii. 154.
—— pauciflora, ii. 154.
—— pumila, ii. 154.
—— tenuiflora, ii. 154.
—— verticillata, ii. 154.
ZINOWIEWIA, i. 189.
Zinowiewia integerrima, i. 189.
ZIZYPHEÆ, i. 195.
ZIZYPHUS, i. 195.
Zizyphus, i. 197.
Zizyphus acuminatus, i. 195.
—— guatemalensis, i. 195.
—— heteroneurus, i. 195.
—— *iguanea*, iii. 138.
—— lycioides, i. 195; iv. 22.
—— obtusifolius, iv. 22.
ZORNIA, i. 273.
Zornia diphylla, i. 273.
Zornia lævis, i. 273.
—— *pubescens*, i. 273.
—— *reticulata*, i. 273.
—— tetraphylla, i. 273.
—— *tetraphylla*, iv. 230.
—— *thymifolia*, i. 273.
Zostera, iii. 440.
ZOYSEÆ, iii. 516.
Zuckertia cordata, iii. 131.
Zuelania lætioides, i. 469.
ZYGADENUS, iii. 382.
Zygadenus, iv. 229, 274.
—— mexicanus, iii. 382.
—— *mexicanus*, iv. 295.
—— porrifolius, iii. 382.
—— volcanicus, iii. 382.
—— *vulcanicus*, iv. 295.
ZYGOPETALUM, iii. 251.
Zygopetalum africanum, iii. 274.
—— aromaticum, iii. 251.
—— bidentatum, iii. 251.
—— burtii, iii. 251.
—— cerinum, iii. 251.
—— discolor, iii. 251.
—— grandiflorum, iii. 251.
—— *grandiflorum*, iv. 301.
—— lacteum, iii. 251.
—— marginatum, iii. 251.
—— moritzii, iii. 252.
—— wendlandi, iii. 252.
ZYGOPHYLLACEÆ, i. 158; iv. 17, 97.
Zygophyllaceæ, iv. 175, 205, 214, 216, 224.
Zygophyllidium biforme, iv. 85.
Zygophyllum tridentatum, i. 159.

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